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ABSTRACT

This report presents an analysis that defines and quantifies the extent of government intervention in the agricultural sectors of the market-oriented countries most active in trade. One aim is to provide usable economic information for the multilateral trade negotiations (MTN), recently launched under the auspices of the General Agreement on Tariffs and Trade (GATT). Results are designed to measure the levels of support (or taxation) provided to both agricultural producers and consumers using the concept of producer and consumer subsidy equivalents (PSEs and CSEs). Overviews are presented of the agricultural policies and perspectives on the new MTN of the United States and other GATT members, particularly the countries of the European Community, Canada, Japan, Australia, and New Zealand. Charts and narrative descriptions of the calculated PSEs and CSEs are provided for grains, oilseeds, cotton, livestock, dairy products, and sugar in 17 countries. PSEs and CSEs are then compared. These findings are reported: less developed countries tend to assist consumers; developed nations tend to assist producers; and assistance to producers of food grains, dairy products, and sugar tends to be higher than assistance to other producers. (YLB)

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Government Intervention in Agriculture

Measurement, Evaluation, and Implications for Trade Negotiations

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ABSTRACT

This study analyzed government intervention in the agricultural sectors of the market-oriented countries most active in trade. Levels of assistance or taxation to agricultural producers and to consumers in the form of domestic farm programs and agricultural trade barriers, which are measured by parameters known as producer and consumer subsidy equivalents, were calculated for 1982-84. Findings reveal a tendency for less-developed countries to assist consumers and for developed nations to assist producers. Assistance to producers of food grains, dairy products, and sugar tended to be higher than assistance to other producers. Results for individual countries and individual commodities gauge the mission facing the new round of multinational trade negotiations to reduce protectionism.

Keywords: agricultural policy, agricultural trade, consumer subsidy equivalent, General Agreement on Tariffs and Trade, government intervention, multilateral trade negotiations, producer subsidy equivalent.

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April 1987

ABOUT THE STUDY

This report is a product of the trade liberalization project, a joint effort of the International Economics Division and the National Economics Division of USDA's Economic Research Service. Additional reports are anticipated from this investigation. Detailed estimates of producer and consumer subsidy equivalents will be published for selected countries and trading regions. These estimates of producer and consumer subsidy equivalents are used as input in the construction of commodity/country trade models. The purpose of the trade models developed by the Economic Research Service is to assess the impacts on world trade volumes, flows, and prices resulting from trade liberalization. Forthcoming reports will present the simulated results of these evaluations.

This report is an update of a staff report of the same title (AGES861216, January 1987), which presented preliminary results. This report includes some additional country and commodity coverage, and revisions resulting from further analysis and availability of improved data. For these reasons, some of the revised commodity/country estimates in tables 2-8 differ from those previously published.

Trade liberalization project work plans were developed and implemented by a steering committee composed of Nicole Ballenger, Vernon Roningen, Bill Coyle, Barbara Chattin, Dale Leuck, Carl Mabbs-Zeno, Gene Mathia, and Harold Taylor.

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SUMMARY

There are no "free traders" among the world's agricultural trading countries. Without exception and with varying degrees of comprehensiveness and success, all governments intervene in agriculture. In this report, we have measured the level of government intervention of many major players in world agricultural trade, an important first step in negotiating a more liberal trading environment.

Government intervention in domestic agriculture can, for example, create imbalances in world supply and demand, it can limit world trade opportunities, and it can depress commodity prices. Because of that, many countries have called for a new international agreement to limit the adverse effects on trade of government intervention in agriculture. The agenda for a new round of multilateral trade negotiations (MTN), recently launched under the auspices of the General Agreement on Tariffs and Trade (GATT), ranks agricultural trade issues as a top priority. These negotiations may yield a more liberal world trade environment.

This report presents an analysis that defines and quantifies the extent of government intervention in agriculture. One aim was to provide usable economic information for the MTN. The measures used are called producer and consumer subsidy equivalents (PSE's and CSE's).

A PSE (CSE) is an estimate of the revenue required to compensate producers (consumers) if existing government programs were eliminated. These measures take account of the usual budget outlays that finance such intervention, but also include policies that do not result in specific budget outlays such as tariffs, import quotas and permits, and variable levies. The results constitute an index of government intervention and provide a common basis for cross-country and cross-commodity comparisons. In effect, these measures allow one, theoretically, to appraise and compare proposed concessions in a multilateral forum like the GATT. This potential for comparability is a significant step toward finding a common ground for negotiations.

The PSE/CSE estimates, based on data for 1982-84, help to gauge the level of assistance to producers and consumers of a particular commodity in different countries and of different commodities in a single country. In addition, the sum of all PSE's within a country is used to rank support to agriculture across countries. Finally, the estimates are used to compare the major sources of support to agriculture across countries and how the cost of producer support is distributed between the consumer and taxpayer.

Exporting countries typically provided less assistance to producers, regardless of the commodity, than did importing countries. In most countries, food grain, dairy products, and sugar were more heavily subsidized than pork and poultry. In most cases, high producer subsidies implied high consumer taxes in the form of high food prices. The exceptions to this were wheat and, sometimes, dairy products; producer price supports for these products were frequently offset by government subsidies to consumers. In less-developed countries (LDC's), producers of some commodities were taxed while others were subsidized depending on the country's economic policy objectives.

The export-oriented countries of Canada, Australia, and New Zealand typically provided only light to moderate assistance to their agricultural sectors.

Assistance to U.S. producers varied by commodity: producers of soybeans, pork, poultry, and beef were lightly assisted while producers of most grains and dairy products were moderately assisted. Assistance in the European Community (EC), with a few exceptions, was in the moderate range. Beef and sugar producers were heavily protected by the EC's Common Agricultural Policy while producers of corn, common wheat, and pork were relatively lightly assisted. Japan gave heavy assistance to producers of some commodities (rice, beef, soybeans, dairy, and grains) and less assistance to producers of others (citrus and poultry).

Several LDC's tax their agricultural producers, particularly of exported commodities like grains and soybeans in Argentina, soybeans in Brazil, cocoa in Nigeria, and cotton in India. In some cases, assistance to LDC producers through input subsidies offset the negative effects of taxes, state trading operations, and foreign exchange policies.

Japan had the highest average support level of all the countries, mainly because of Japan's high support to rice producers. The EC had the second highest average, with most EC commodities supported at levels close to the EC average. Although certain U.S. commodities were supported at higher levels than in Canada or New Zealand, all three countries ranked very closely. Australia had the lowest level of producer support among the developed countries, reflecting the fact that only Australia's dairy producers received significant levels of price and income support.

The distribution of the cost of government support to producers between food consumers and taxpayers differs markedly among countries and among commodities. Border measures affect prices to consumers as well as producers and are typically viewed as a hidden subsidy to producers. In the EC and Japan, most of the cost of public assistance to agricultural producers was borne by consumers through higher food prices. In both Canada and the United States, most support to grain and beef producers came from taxpayers. U.S. and Canadian dairy consumers, however, bore most of the cost of support to producers. Australian consumers bore the high cost of dairy pricing policies but none of the cost of supporting beef producers.

Government Intervention in Agriculture

Measurement, Evaluation, and Implications for Trade Negotiations

INTRODUCTION

The United States and the other parties to the world's foremost international trade arrangement, the General Agreement on Tariffs and Trade (GATT), have formally agreed to participate in an eighth round of multilateral trade negotiations (MTN). The negotiations were launched in Punta del Este, Uruguay, in September 1986 with the signing of the ministerial declaration. The broad objectives and principles for these negotiations, to be called the Uruguay Round, are set forth in the declaration. Discussions on organizational matters and trade negotiating plans began in October 1986. Hard bargaining is expected to be under way by spring and agriculture will receive notably greater attention in this process than ever before. One of the major U.S. objectives is to liberalize agricultural trade. Other major aims are to reach agreements that would free trade in services, expand foreign investment opportunities, and provide guidelines for international transfers of intellectual property rights.

The importance of agriculture in these negotiations is related to current problems in the international agricultural trade environment. Although many factors account for adverse agricultural market conditions, the agricultural policies of trading countries are thought to contribute significantly to them (7).1/ Trade barriers and domestic agricultural policies insulate agricultural producers in many countries from international competition and discourage supply adjustments. Consequently, world supply has grown faster than demand, putting downward pressure on world prices. As agricultural market conditions have worsened, many countries' dependence on trade barriers, domestic price supports, and income support programs to protect incomes has increased further. While these programs do protect farmers, they are also extremely costly to taxpayers and, often, to food consumers. Limited opportunities for expanding world agricultural trade in the eighties have also heightened tensions among trading partners and competitors over the use of such policy instruments.

In this environment, bilateral agricultural trade disputes, often involving GATT panels as arbitrators, have proliferated since the last MTN ended in

1/ Underlined numbers in parentheses identify literature cited in the references at the end of this report. Also see the glossary at the back for an explanation of technical terms and phrases used throughout this report.

1979. Because GATT rules on use of trade barriers are loosely worded or are lenient on policies restricting agricultural trade, they have proved inadequate for resolving disputes. This situation provided a major impetus for the call by the United States and many other important agricultural traders for a new MTN round.

Negotiations on agriculture will be difficult and their outcomes are, at this point, difficult to predict. Many countries, however, have a strong interest in reaching an agreement that would limit the ability of all countries to restrict trade opportunities and improve the functioning of the world agricultural market. Reaching such an agreement requires extensive knowledge on the part of all MTN participants of each other's agricultural policies and of the potential effect of these policies on trade.

This report presents the results of a study designed to measure and compare the level of government assistance to agriculture in many important agricultural countries and commodity markets. It is well known, as this study's results confirm, that government involvement in agriculture is both widespread and important in terms of providing farmers with income protection. However, relatively little published research has facilitated extensive cross-country or cross-commodity quantitative comparisons of government assistance (3, 4, 7, 8, 9, 14).2/ Our study fills that gap. It also highlights the differing points of view that must converge to forge a successful MTN agreement. We therefore also provide the reader with policy profiles and the perspectives that several major participants or blocks of participants will bring to the MTN.

THE WORLD AGRICULTURAL TRADE ENVIRONMENT

During the seventies and eighties, both the importance of the United States in the world market for farm products and the importance of the world market to U.S. agriculture increased. While world agricultural trade expanded, the U.S. share of the market increased at an unprecedented pace during the seventies. World trade expanded fourfold, while U.S. exports increased sixfold. Over a third of U.S. cropland was committed to producing commodities for export by 1980, and 2 of every 5 tons of the farm products traded worldwide were produced in the United States.

In the eighties, these trends reversed. Growth in world agricultural trade, for example, essentially stopped, and U.S. exports dropped more than a third. This 40-million-ton drop in exports, following the 95-million-ton increase during the seventies, is central to many problems that U.S. agriculture faces today and provides the major impetus for U.S. participation in multilateral agricultural trade negotiations.

Expanding Markets in the Seventies

A wide range of factors created unprecedented growth in the world market for farm products, particularly those produced in the United States. Growth in output slowed because of adverse farm financial conditions of the previous two decades and adverse weather. Consumption rose substantially because of

2/ In addition to the work referred to in the cited references, such work is ongoing at the Organization for Economic Cooperation and Development.

population and income increases in the middle-income countries, and policy changes in the centrally planned economies. The simultaneous expansion of the world money supply (as the Eurodollar market expanded, new reserve assets were created, and the world's banking system recycled petrodollars) provided the financial underpinning for an expanded world agricultural trade.

Agricultural and trade policy changes in many importing and exporting countries also encouraged growth in trade. Many countries eased import restrictions that had been designed to protect foreign exchange reserves and support domestic farm programs. Some countries, including several members of the Organization of Petroleum Exporting Countries (OPEC), actually instituted import subsidy programs. Other countries downplayed longstanding self-sufficiency goals and simplified importing procedures in the face of rising political pressure for dietary improvements. The USSR, East Europe, and China all became steady and important participants in the world market.

World agricultural trade expanded from $50 billion in 1970 to more than $225 billion by 1980. The number of countries that depended regularly on imports or exports for more than 5 percent of their food supplies or markets grew from fewer than 25 in 1970 to more than 40 by 1980. The U.S. share of this expanded market of the seventies increased sharply. Farm legislation passed in the late sixties and macroeconomic policies already in place contributed further to U.S. export expansion in the seventies. The farm legislation of the late sixties began the separation of income and price supports that, combined with increasing foreign demand, would allow U.S. prices to reflect world supply and demand conditions rather than domestic farm income goals. Dollar devaluations in 1971 and 1973 and further weakening of the dollar in the second half of the seventies lowered the local currency cost of importing U.S. farm products in many key importing countries. In addition, transportation difficulties limited the ability of several exporters to expand sales in years when their supplies were large.

Stagnant Market of the Eighties

Many of the same factors that worked to expand trade in the seventies contributed to trade decline in the early eighties. Production increased from 2.2 percent to 2.6 percent per year because of expanded investment in agriculture, technological advances, and improved weather, while consumption growth dropped sharply as economic growth slowed worldwide. This slower economic growth encouraged many importing countries to limit, and in some cases reverse, their dependence on imports. Slower economic growth also made importing countries more conscious of the employment and foreign exchange costs involved in importing. Trade policies and domestic programs worked nearly automatically with the market reverses of the eighties to protect farmers in importing and exporting countries from drops in world prices and cutbacks in production.

Changes in the international financial environment also encouraged less dependence on imports. Growth in export earnings by middle-income countries fell precipitously from over 20 percent per year in the late seventies to less than 3 percent in the early eighties due to the general contraction in world trade and a drop in primary product prices.

The centrally planned countries also face serious problems with their export earnings. For example, USSR's hard currency exports increased from $2 billion

a year in 1970 to over $23 billion in 1980, stagnated in the eighties, and could possibly fall more than a quarter in 1986-88 because of lower oil prices.

The tightened supply and rising cost of credit also discouraged imports in recent years. With the value of the dollar up sharply, local currency cost of transactions made in dollars--including repayment of debts incurred in the seventies--also rose sharply. These factors forced many developing and East European countries to reduce imports and allocate their foreign exchange to servicing their accumulated debts. At the same time, the conditions encouraged many developed countries to slow or reverse growth in imports.

Agricultural Trade Adjustments

Agricultural trade has not fared well in the adjustment process touched off by changes in the macroeconomic, financial, and policy environments. World trade stagnated in the first half of the eighties, but U.S. farm exports fared even more poorly, with shipments off a third from the 1981 record high.

Dollar appreciation in the eighties weakened the U.S. competitive position compared with producers in countries with depreciating currencies. A higher priced dollar also discouraged growth in imports by raising the local currency price of dollar-denominated farm products.

U.S. farm policies interacted with policies abroad to reinforce the U.S. trade adjustment burden. High and rigid price supports set without fully anticipating market conditions made it unattractive for U.S. producers to sell their products abroad. The U.S. Government and the taxpayer bore a large share of the cost of adjusting to slowed trade growth.

The U.S. agricultural sector confronts a far-reaching restructuring, complicated by the world market's limited ability to react to changes in supply and demand without sharp adjustments in prices and production in the countries linked to the world market. These adjustments point out the importance of improving the operation of the world market through initiatives like the MTN.

AGRICULTURE IN THE GATT

The agricultural policies of trading countries are thought to be an important contributor to both falling commodity prices and the slow growth of world trade in the eighties. Trade barriers, price and income support programs, and other domestic agricultural policies buffer agricultural producers in many countries from world price movements and discourage supply adjustments. In this policy environment, world supply has continued to grow faster than demand, leading to unprecedented stock accumulations and putting downward pressure on world prices.

The United States has not fared well in the agricultural trade environment of the eighties. The value and volume of U.S. agricultural exports and the U.S. share of the sluggish world agricultural market have all declined during this period. The United States responded to this situation in several ways: directly, through revising its farm commodity programs to enhance the competitiveness of U.S. farm exports; and indirectly, through participating in internationally coordinated efforts to lower the value of the U.S. dollar and

by taking part in the GATT. The United States expects that its farm exports would benefit from a more liberal agricultural trading environment, in which both import barriers and export subsidies would be reduced, and that important steps in this direction can be made in multilateral negotiations conducted under GATT auspices.

GATT Rules on Agriculture

The GATT, now signed by 92 countries, is both a multilateral agreement that lays down rules and guidelines governing world trade and a forum in which countries can discuss and resolve trade problems. It provides the contractual rights and obligations for contracting parties to formally challenge other members' trading practices under GATT procedures. Consultation, conciliation, and dispute settlement are fundamental to GATT's work. The GATT also functions as the principal international body concerned with negotiating reductions in tariff and nontariff barriers through the MTN.

Trading practices that can be protested by governments as being inconsistent with the GATT agreement include, but are not limited to, quantitative import restrictions and export subsidies. Formal protests filed by U.S. farm organizations and the U.S. Government against foreign agricultural trade policies grew dramatically after 1979. At the close of 1985, cases involving agricultural products represented over half of the pending U.S. section 301 trade disputes (1).3/ Most cases involved the European Community (EC), Japan, and Canada. Recent cases have also involved other U.S. trading partners and competitors, such as Argentina and Brazil. The United States is also involved in disputes initiated by other countries, such as Canada, over the use of U.S. agricultural trade barriers and domestic agricultural policies.

Countries continue to turn to the GATT for guidance in settling agricultural trade disputes even though GATT rules on agricultural products have proven inadequate in this respect. Some bilateral disagreements have gone unresolved for many years. This is a major reason that the United States and other member countries have agreed to convene a new round of multilateral trade talks in which agriculture will be a key item on the negotiating agenda.

The GATT rules on agriculture need to be strengthened. A general principle of the GATT is that trade should be restricted only through the use of uniformly applied tariffs. In practice, however, countries use many forms of nontariff barriers under GATT exceptions and waivers. Nontariff barriers are particularly widespread in agriculture. The GATT provides no clear guidelines for the use of policies such as variable levies and voluntary export restraint agreements.

GATT does provide rules on the use of quantitative restrictions and subsidies, but these rules are not always effective in regard to agricultural products. For example, GATT's Article XI generally prohibits the use of quantitative trade restrictions, but there are several exceptions to the general prohibition where such restrictions are applied to agricultural imports and exports.

3/ Section 301 of the Trade Act of 1974, as amended, authorized the President to take all appropriate action, including retaliation, to obtain removal of any act, policy, or practice of a foreign government which is found to violate an international trade agreement.

Formal waivers to Article XI have also been granted. For example, the United States was granted a formal waiver in 1955 allowing quantitative restrictions to be imposed on agricultural imports under section 22 of the U.S. Agricultural Adjustment Act when imports would nullify or materially interfere with the operations of Government commodity programs.4/ Other countries, such as those of the EC, that do not request formal waivers, have been able to circumvent Article XI by applying other forms of nontariff barriers not explicitly covered by the GATT.

The GATT code on subsidies and countervailing duties (the subsidies code) treats differently subsidies on primary and nonprimary products. Export subsidies on nonprimary goods are generally prohibited, but export subsidies on primary products are allowed so long as the country that subsidizes a product does not acquire "more than an equitable share of world trade" in a previously representative period (5). In 1983, a GATT panel was unable to reach a conclusion on a subsidy complaint by the United States regarding EC wheat flour export subsidies because of the vagueness of this concept. In the case of domestic subsidization, contracting parties to the GATT are merely encouraged to "weigh possible adverse effects of domestic subsidies on trade" (5).

The subsidies code is concerned with the trade effects of export and domestic subsidies. It does not provide a legal definition of a subsidy (except in terms of trade effects), and it does not help countries identify types of domestic policies that could be subject to countervailing duty legislation. The problem of what is a "countervailable subsidy" has been a major source of contention in countervailing duty cases involving the United States, Canada, and the EC.

The United States and many other important world agricultural suppliers have come to recognize the inadequacies of existing GATT rules for agriculture and the need to "bring agriculture more fully into the GATT." Although this is a major goal of the new round of multilateral negotiations, it will be a particularly difficult task for a number of reasons. First, agricultural trade barriers are typically linked to domestic price-support programs, which are strongly backed by national interest groups and reflect national policy objectives. Countries are usually unwilling to subject these policies to international scrutiny. Second, many forms of government assistance that benefit agricultural producers and have substantial trade effects, through their effects on production, are not trade barriers. Direct income payments, input subsidies, marketing subsidies, and transportation subsidies fall into this category. These policy tools typically have been outside GATT jurisdiction. However, domestic forms of assistance are increasingly cited as problems in bilateral disputes, suggesting the need to develop guidelines for their use. Third, GATT members employ such dramatically different farm policies that to find common ground in the negotiating process is exceedingly difficult. Countries cannot merely pursue product-for-product concessions on tariff rates; they must find their way toward mutual reductions of nontariff barriers and other forms of agricultural assistance whose impacts may be very difficult to measure and compare. Despite these difficulties, contracting parties have expressed their commitments to solving complex agricultural trade issues in the new GATT round.

4/ Section 22 of the U.S. Agricultural Adjustment Act restricts imports of specified agricultural commodities to prevent interference with price support programs.

The Uruguay Round

When the new MTN round was launched in Punta del Este, Uruguay, contracting parties agreed that negotiations on agriculture "shall aim to achieve greater liberalization of trade in agriculture and bring all measures affecting import access and export competition under strengthened and more operationally effective GATT rules and disciplines" (6). They drew up three broadly stated objectives:

- o Improve market access through the reduction of import barriers.
- o Increase discipline on the use of all direct and indirect subsidies and other measures affecting agricultural trade, reduce their adverse trade effects, and deal with their causes.
- o Minimize the adverse effects that unnecessary health and sanitary regulations can have on trade in agriculture.

A multilateral approach to achieving these objectives still has not been agreed upon. Several approaches are possible, each with limitations and not necessarily mutually exclusive. For example:

- o Countries could negotiate tariff, nontariff, and, possibly, domestic policy concessions on an offer-request basis.
- o Countries could agree to limit the trade effects of their trade and domestic policies through, for example, strengthening the "more than equitable share of world trade" rule that currently limits the use of export subsidies.
- o Countries could negotiate the use of types of policy instruments, including both nontariff barriers and domestic policies. That is, some policies to be negotiated would be labeled GATT-inconsistent due to their trade-distorting effects; others would be identified as consistent with the GATT.
- o Countries could agree to reduce all nontariff measures which affect trade and make whatever adjustments are necessary in domestic programs to comply with that commitment.
- o Countries could agree to freeze and reduce the total level of support provided to producers of individual commodities, regardless of the policy instruments used to achieve that level of support.

Data and Analytical Needs for the MTN

To negotiate effectively on trade barriers and domestic policies that indirectly affect trade, negotiators must have a good understanding of the types and levels of government intervention found in agriculture and of policy influences on the domestic economy and trade. Both the Foreign Agricultural Service and the Economic Research Service (ERS) of the U.S. Department of Agriculture (USDA) are currently contributing to a comprehensive international catalog of tariff, nontariff, and domestic policy measures for important agricultural commodities. This type of policy data was compiled for previous MTN rounds. In the past, only tariff data indicated the actual level of

protection associated with the use of a government policy instrument. Nontariff barrier data were purely descriptive so that it was impossible to compare the effect of a tariff barrier with the effect of a nontariff barrier. This lack of comparability complicates the ability of negotiators to strike agreements on reducing nontariff trade barriers.

Given the very broad scope of agricultural policy issues likely to be addressed in the current MTN, a quantitative analysis of the tariff equivalence of nontariff forms of government support to agriculture would be an important contribution to the policy data base. This would help countries arrive at reciprocal concessions involving nontariff as well as tariff barriers. If countries agree to attempt to reduce the overall level of support provided to their farm sectors or to producers of individual commodities, then some measure of the initial and subsequent levels of support must be determined.

Quantifying the effects of nontariff barriers and domestic policy measures is an extremely ambitious undertaking since countries must agree on an approach to measuring government intervention and on a representative period for the analysis. We have found in this research that the data necessary for a thorough and consistent analysis across countries may not be readily available, particularly for developing countries.

We present in this report the results of analysis designed to measure the levels of support (or taxation) provided to both agricultural producers and consumers using the concept of producer and consumer subsidy equivalents.5/ These measures of government support to the agriculture sector do not directly reveal the effects of government policies on agricultural production, consumption, and trade. When coupled with other information such as trade shares, they may, however, indicate where large gains or losses can be expected from trade liberalization. The trade negotiation process should be further supported by world trade models that can be used to assess the domestic and world effects of reducing or eliminating the level of government support to agriculture. In calculating the measures of assistance to agriculture for this report, our intent is to include as broad an array of policy instruments and farm programs as possible. Which policies will be put on the negotiating table in the upcoming talks is still subject to considerable discussion among participating nations.

PERSPECTIVES OF GATT PARTICIPANTS

The United States was a leader in calling for a new round of trade negotiations and in stressing the need to assign a high priority to agriculture. The United States and a number of other GATT members, particularly the countries of the EC, Canada, Japan, Australia, and New Zealand, are expected to play prominent roles in the agriculture talks. This section presents overviews of these countries' agricultural policies and their perspectives on the new MTN.

5/ Producer and consumer subsidy equivalents are economic, not legal, concepts. To avoid confusion with references to subsidies in the GATT or national trade law, the economist's concept of producer subsidies is referred to as support, assistance, or taxation when discussing empirical results of the analysis.

The attempt to measure government support to agriculture was extended to a number of less-developed countries (LDC's), most of them considered newly industrialized. These countries play increasingly important roles in world agricultural trade as both exporters and importers, and they are expected to be more active in this round of GATT negotiations than ever before. Although major differences exist among LDC's, they are treated here as a bloc.

The United States

The United States is the world's most important agricultural exporter, despite significant declines in its exports since 1981. Exports, which amounted to about $27 billion in 1985, contribute significantly to farm cash receipts (13). A positive agricultural trade balance strengthens the overall U.S. balance-of-payments position. Exports are particularly important for grains, oilseeds, and cotton since only a little over half of the grain and oilseed produced is consumed domestically and more than half the cotton produced is exported. The U.S. farm sector's growth is closely correlated to growth in foreign demand for U.S. exports.

The most important sources of U.S. Government assistance to producers of grain, oilseed, and cotton are components of price and income support programs: nonrecourse commodity loans, Commodity Credit Corporation (CCC) inventory and financial activities, direct cash transfers for deficiency payments (grains and cotton), farm storage payments (grains only), and, in some years, paid land diversion (grains and cotton).

To be eligible to receive price and income support program benefits, grain and cotton farmers often must comply with acreage reduction or other supply control programs. Acreage reduction is not a feature of the soybean program. When acreage control programs are in effect, a portion of a farm's acreage base must be devoted to an approved conservation use. The acreage-diverting programs are designed to offset the supply-stimulating effect of price and income support programs. A key distinction between the policies of the United States and other countries is the emphasis on acreage restrictions.

The nonrecourse loan program allows producers to obtain a loan at a specific rate per unit of the commodity by pledging crops from the current year's production as collateral. Grain and cotton producers participating in acreage reduction programs, and all soybean producers may obtain CCC regular commodity loans for 9 months. All grain producers except rice producers may also place their crops in a long-term loan program (the farmer-owned reserve). Producers receiving commodity loans have the option of repaying their loans with interest or forfeiting their crops to the CCC. The interest rate on CCC nonrecourse loans is usually below the commercial lending rate, implying an implicit interest rate subsidy to grain, soybeans, and cotton producers. By removing supplies from the market, particularly through forfeitures or long-term storage, the loan rate becomes the minimum price that participating farmers receive for their crop. If participation in the program is high enough, the nonrecourse loan program supports the price to all domestic producers and extends this price protection to international producers as well.

During 1982-84, the United States reduced supplies (through acreage reduction and stocking) and thereby maintained world prices near the loan rates for many commodities. As a result of provisions contained in the Food Security Act of 1985, commodity loan rates have since declined significantly for all

commodities. The 1985 Act contains new marketing loan provisions for rice and cotton that ensure that the sales prices of those commodities reflect world market prices.

The CCC acquires stocks of grains, soybeans, and cotton as a direct consequence of the nonrecourse loan program, and CCC resale of these stocks is subject to several restrictions. The CCC also purchases commodities for domestic and international commodity donation programs. CCC inventory and financial operations are major sources of government assistance to grain, cotton, and soybean producers.

Payment-in-kind (PIK) programs, whereby producers receive commodities from storage in exchange for idling wheat, rice, corn, barley, oats, sorghum, and cotton acreage, have been used to reduce levels of stocks held in CCC inventories and to reduce nonrecourse loan payments. The 1983 PIK program was the largest acreage and stock reduction program in the nation's history. The 1983 PIK program removed more acreage from production than was planted in all of the EC-10 in program commodities during that year. A PIK program also was used for wheat in 1984.

A system of target prices and deficiency payments for grain and cotton producers supplements price supports provided through the nonrecourse loan and stock management programs. The target price, generally set above the loan rate, is used to calculate deficiency payments which, for most commodities, make up the difference between the target price and the higher of (1) the average market price during the first 5 months of the marketing year or (2) the national average loan rate. Wheat and feed grain producers also receive annual payments to help defray the cost of storing grain in the farmer-owned reserve. These direct cash payments, together with the value of PIK commodities, are an important source of government assistance to grain and cotton producers.

Domestic prices of dairy products are maintained through import quotas and tariffs. Legislated minimum prices for milk used for manufactured products such as cheese and butter are also supported through CCC purchases of cheddar cheese, butter, and nonfat dry milk. The loan rate for sugar has been maintained through the ever tightening quota. Government policies for dairy and sugar support domestic prices above external prices.

The United States has no domestic price and income supports for beef, poultry, or pork. Most meat imports are subject to a tariff. In addition, quotas may be imposed under the provisions of the Meat Import Act of 1964 (amended in 1979) on fresh, chilled, or frozen beef, veal, mutton, and goat meat products. The quota has been imposed only once, in the last quarter of 1976. In some years, voluntary export restraint agreements on meats covered by the act have been signed with foreign governments.

Most U.S. producers also benefit to some degree through research, extension, and inspection services, interest rate concessions on Farmers Home Administration operating loans, exemption from taxes on fuel used for off-highway purposes, and crop insurance.

Over the past year, U.S. policymakers have continually expressed the need for internationally agreed upon and enforced guidelines over the use of agricultural import restrictions and export subsidies to ensure continued U.S.

export sales. The United States expressed three major objectives prior to the start of the new round: (1) to phase out import restrictions on agricultural products, (2) to treat agricultural export subsidies the same as subsidies for industrial products, and (3) to eliminate unnecessary health and sanitary regulations that impede market access in other countries.

In September 1986, the United States came away from the GATT ministerial meeting in Punta del Este satisfied with the language on agriculture in the ministerial declaration. The terms of the declaration opened agricultural trade issues to negotiation and recognized the need to address critical agricultural trade problems. The language on subsidies calls for greater discipline on all subsidies, including a phased reduction of the negative effects of all direct and indirect measures affecting world agricultural trade and dealing with their causes. This broad language will allow negotiators to address direct export subsidies, such as those administered by the EC. However, the broad language will also allow negotiators to focus on the declaration's mention of other "measures affecting directly or indirectly agricultural trade," including U.S. agricultural policy measures that have the potential to affect imports and exports.

The United States views multilateral trade liberalization as a means of gaining increased foreign market access for efficient U.S. producers and reducing competition faced by U.S. suppliers from subsidizing exporting countries. U.S. taxpayers would benefit from trade liberalization as government costs of farm programs would be reduced. Trade liberalization could also, however, involve increased competition for U.S. producers of imported products such as dairy, sugar, peanuts, and tobacco. Consumers of these products would benefit from increased supplies and lower prices.

The European Community

Since the Common Agricultural Policy (CAP) was established in the early 1960's, the EC has shifted from being a net importer of most agricultural commodities to being a major agricultural exporter. It has done so by making extensive use of variable levies and export subsidies. During 1982-84, EC exports as an approximate percentage of world trade were 20 percent for sugar, 40 percent for butter, 30 percent for poultry, and about 20 percent each for beef, cheese, pigmeat, and grains.

EC agricultural producer incomes are supported mainly through commodity price supports provided by the CAP. The EC's direct payments for the purpose of financing structural measures also play an important role in some regions and for some products, but overall these are quite small. Member countries also provide some national subsidies to producers and consumers which are not included in this study.

The EC links price supports for all commodities to target prices that are generally established well above world prices each year by representatives of all member countries. Minimum import prices are linked to all target prices, except those for oilseeds, to keep the price support system from being undermined by cheaper imports. Variable levies, equal to the difference between the minimum import prices and the lowest c.i.f. offer price, are charged on imports of these commodities. Finally, intervention prices are also linked to the target prices except for oilseeds. Intervention agencies in the member countries are required to buy surplus commodities when market

prices fall below intervention prices. Although surplus stocks are eventually sold on world markets with large export restitutions (subsidies), large stocks of dairy products, beef, and grains currently exist.

Levies on oilseeds and most other nongrain feed ingredients were bound at zero by the EC during an earlier round of MTN. Therefore, large amounts of nongrain feeds are used by feed compounders near ports who find them to be less expensive feedstuffs than grains whose prices are kept high by the CAP. As a result of the zero-binding, the EC provides deficiency payments to encourage domestic oilseed production.

There is pressure on the EC to modify its price support and trade policies from budgetary costs, consumer costs, and external criticisms. Agricultural budget costs were approximately $23 billion in 1986 and are expected to increase if surpluses increase or world prices continue to decline. Although food costs have fallen as a share of total expenditures, variable levies have made food relatively expensive for consumers and reduced consumption. Finally, other exporting countries have been critical of trade effects produced by the CAP. Although there have been some reforms in the last several years, surpluses are expected to remain large and will likely increase for some commodities.

The EC was initially reluctant to place its export subsidies on the negotiating agenda of the current MTN, and did so only after language was adopted that could open U.S. deficiency payments and Canadian transportation subsidies to negotiation.

The EC did not object to the principle that improving market access should be a major goal of the negotiations because it sees potential gains in other markets such as Japan. Improving market access could also affect the EC's system of import levies. This system accounted for about 72 percent of total government assistance to producers during 1982-84, while export subsidies, direct payments, and other budget costs accounted for 28 percent of total assistance. Easing market access could be very costly to EC farmers or could put additional strain on the EC budget.

The cost to EC farmers of a total trade liberalization through dismantling the variable levy system and eliminating all direct payments and export subsidies could be significant for most commodities. On the other hand, the benefits to consumers and taxpayers of total trade liberalization could be substantial.

Although export subsidies have been placed on the negotiating agenda, a number of factors will make even partial trade liberalization difficult. An important factor may be the "equivalence of effect" which the EC perceives exists between its export subsidies and U.S. deficiency payments.

Another difficulty lies in the fundamental role of export subsidies in allowing the EC to maintain farm incomes. If the EC were to neutralize its export subsidies by imposing an offsetting tax on producers, as it has done with sugar, farm incomes would decline. Export subsidies made up nearly 30 percent of the support to producers of grain, about 15 percent for dairy, 8 percent for beef, and about 5 percent for poultry meat and pork. Such an offsetting tax would represent nearly 4 percent of the gross value of production for all commodities. The negative effect on net farm incomes would be much larger than the effect on gross value of production and would be

especially significant for grain, beef, and dairy products. Consumers would not benefit from a producer tax unless support prices were also reduced.

The EC could benefit from increased discipline in the use of export subsidies to reduce expected growth of subsidy costs. If recent growth in grain production continues, the EC-12 could increase its current 15-million-ton grain surplus to around 40 million tons in 10 years. A weak dollar and declining U.S. wheat support prices could cause export refunds of at least $130 per ton to continue. At such costs for export refunds, exports of 40 million tons of surplus grain by 1995 would require around $5 billion in export subsidies for grain alone, compared with current total CAP expenditures of about $23 billion. With unrestricted growth, total export subsidies could make up about half of total CAP expenditures by 1995.

As in prior negotiations, the EC may attempt to "complete the CAP" by application of some type of tariff or levy on soybeans, corn gluten, and other nongrain feed ingredients. In exchange, the EC might offer to reduce or change the level or nature of protection on grains. Such an agreement to "harmonize" protection of grains and oilseeds would require the United States to give up the earlier agreement that prevents imposition of variable levies on oilseeds and nongrain feeds. Currently, the EC probably imports more oilseeds and nongrain feeds than it would if restrictions on imports of grains through variable levies were eliminated.

The budget costs of exporting sugar have been reduced with the application of producer coresponsibility levies. Similar levies on grain production were introduced in 1986 as one way to deal with expected increases in export subsidy costs. Because they shift some of the costs of export subsidies from the budget, coresponsibility levies are appealing to the EC. However, as the EC found when such levies were applied in the dairy sector, they do not prevent production increases arising from productivity growth. Furthermore, unless production is reduced or demand is increased, the need to cope with growing surplus disposal costs remains.

One proposal regularly suggested by the EC is to manage trade by sharing markets. This would commit countries to stabilizing production or exports, regardless of their comparative advantage. The United States has generally opposed market-sharing agreements.

Japan

Japan is the largest net importer of agricultural products in the world, accounting for about 9 percent of total world farm trade. This statistic reflects Japan's heavy dependence on raw material imports, a dependence arising from its comparative advantage in manufacturing and disadvantage in primary production. By protecting Japanese farmers from international competition, Japan's agricultural policies keep agricultural resources from shifting into more efficient sectors. Levels of protection since the late fifties and early sixties have risen for some significant commodities like rice and beef. Despite such protection, the country's agricultural self-sufficiency rate still dropped from 75 percent in 1960 to about 45 percent currently (original calorie basis), one of the lowest levels among developed countries.

A principal goal of Japan's agricultural policy since the sixties has been to achieve and maintain income parity between farm and urban households. The Japanese also regard national food security as especially important. These priorities have led the Government to maintain farm product prices at high levels, particularly for Japan's dominant crop, rice. A state trading corporation, the Japan Food Agency, purchases rice and other food grains at an annually announced price. The Food Agency resells food grains to wholesalers, also at a price set annually. Although domestically produced grains are also sold through private channels, the Food Agency's purchase and resale prices effectively dominate these markets. To help keep Japanese prices far above levels prevailing in international trade, Japan severely restricts imports.

A major policy concern has recently gained prominence: avoiding surplus rice production. Rice production exceeded demand during 1967-69 and 1973-79. As a result, the Food Agency was left with burdensome stocks in the late sixties and late seventies. In both instances, the Government paid farmers large diversion payments for planting paddy land to substitute crops. The Food Agency disposed of surplus rice by subsidizing its use for feed and export. The United States strongly objected to Japan's rice exports in 1979 and 1980, and ultimately negotiated a limit of 1.6 million tons for 1980-84. During these years, rice stocks were also depleted by 4 consecutive years of below-average crops. With stocks now rapidly accumulating again, Japan may have to reconsider subsidizing exports in the late 1980's.

In the livestock sector, Japanese protection from international prices varies strongly according to the product. Feedstuffs are imported with a minimum of intervention, and the efficient poultry industry is protected only by relatively low tariffs. The pork industry is assisted by a variable levy on imports. The cattle industry is more heavily protected. Japan imposes import quotas on most dairy products. Natural cheese imports are restricted by a tariff quota in which imports beyond a certain predetermined level are subject to a 35-percent tariff. Beef imports are severely restricted by quotas, tariffs, and surcharges which result in domestic beef prices more than double those of world prices. A 1984 understanding with the United States resulted in a schedule for Japan to raise its quotas for grain-fed beef imports through Japanese fiscal year 1987.

As the world's largest net importer of agricultural products, Japan will be reluctant to offer significant concessions on its trade barriers during the present MTN round. Japan is likely to support multilateral measures to enhance food security, such as an international convention banning embargoes of agricultural exports. The Japanese Government has also argued for the maintenance of international buffer stocks. Japan has relied on bilateral supply-purchase agreements (the Butz-Abe understanding of 1975-78 involving wheat, soybeans, and feedgrains and a multiyear agreement with Australia on sugar signed in 1974) for a number of agricultural products but it is unlikely to enter into similar arrangements as long as the world has an oversupply of agricultural products.

In the next few years, Japan will have to consider significant concessions on rice. If rice surpluses develop, Japan may have to renew limits on its rice exports and make downward adjustments in producer incentives.

In the longer term, more fundamental change in Japanese agricultural policy is likely. With the current generation of farm operators aging, there will be an

opportunity for consolidation of farmland into larger, more economical units. The larger farms should be more efficient and require less government assistance and border protection. The political influence of agricultural producers is likely to diminish as the memory of World War II food shortages fades, as the link between the urban and rural populations weakens, and as reform of Japan's gerrymandered political districts (favoring rural voters) progresses.

Canada

Canada has been a strong supporter of a new MTN round because both its economy and agriculture are highly dependent on exports, especially of grains, oilseeds, and livestock products. Canada feels it will benefit in general from a freer and more open world trading environment. Canada has stated that agriculture is its highest priority in the new MTN round and particularly wants to see subsidy issues clarified. It feels it is caught in the middle of a U.S.-EC agricultural subsidy war that is driving farm prices to unprecedented low levels. Canada participated in Australia's August 1986 meeting of "nonsubsidizing agricultural exporting countries."

Canadian agriculture is heavily regulated, but levels of producer protection vary significantly by commodity. For grains and oilseeds, Canada feels it will benefit from reduced world protectionism and subsidies. Government support is relatively low and comes primarily in the form of transportation subsidies, although income stabilization payments have increased in recent years with the decline in world prices. Livestock products are exported primarily to the United States. Producers receive limited support through a federal stabilization program, but provincial programs (not included in this analysis) have provided significant support.

The benefits of trade liberalization to producers of grains, oilseeds, and livestock products would come primarily through higher world prices, due to removing price-depressing export subsidies, and improved market access. Consumers are only lightly taxed through various border restrictions and would not see significant benefits as a result of freer trade.

In contrast, the Canadian dairy and poultry sectors are heavily protected by a combination of domestic supply management systems that control production and border restrictions that limit imports. Although these systems are currently allowed under an exception to GATT Article XI, Canada's negotiating position is not clearly defined. If the systems were changed and the border opened to imports at world prices, substantial structural adjustment would follow. Consumers would, of course, benefit from increased supplies and lower prices.

Canada and the United States are currently involved in bilateral free trade discussions concerning some of the same issues as the MTN. A major Canadian objective in discussing agriculture and other primary products appears to be to gain exemption from U.S. countervailing duty and antidumping laws because Canada has been the subject of numerous U.S. investigations and duties in recent years. This objective is more narrow than Canada's MTN objective.

Agriculture is being discussed in the U.S.-Canadian talks, but much remains to be reviewed between the two countries. Under current fast-track authority, an agreement between Canada and the United States must be made by January 1988. Progress in these bilateral talks will certainly interest all MTN participants.

Australia

Australia is the largest exporter of beef and wool and second-largest exporter of sheep meat. Australia ranks third in exports of wheat and sugar, and is a major supplier of coarse grains, cotton, and other crop and livestock products.

Agricultural exports accounted for a third of Australia's total merchandise export receipts and two-thirds of the value of farm output in recent years. Four-fifths of the wheat and barley produced is exported, and almost three-fourths of the sugar, rice, and cotton. Exports claim half of the beef produced and over 95 percent of the wool.

Australia's agricultural policies reflect its comparative advantage in extensive cropping and livestock operations and its dependence on exports. Agriculture is heavily regulated while assistance levels vary. Support levels for several commodities have risen in response to depressed world market conditions. Statutory marketing authorities regulate sales of major products. Discriminatory domestic pricing policies provide assistance to agricultural producers, yet Australian consumer food prices are still among the world's lowest. Farmers are also protected by certain border measures. Australians believe that their agricultural income and potential are reduced by foreign trade barriers.

The Australian Government is actively seeking commitments to restrain the use of subsidies and import restrictions, particularly by the EC, United States, and Japan. Australia took a leadership role in preliminaries to the GATT negotiations. In August 1986, the Government of Australia convened a meeting of 14 nonsubsidizing agricultural exporting countries. This group agreed to work together to assure that the present round of MTN significantly reduces agricultural subsidies and improves market access.

Australia's major objective in the GATT negotiations is to phase out agricultural export subsidies. Australia believes its export revenues have been reduced by subsidized EC grain, dairy, sugar, and beef exports and the U.S. export programs for grains. Market access is a second area of concern because Australian farmers would benefit from increased foreign demand for the wide range of products that they can produce at low cost. Meats, sugar, and dairy products are important examples. A weak bilateral bargaining position, caused by a small domestic market and trade surpluses with Japan and several other major agricultural importing countries, has led Australia to push for multilateral negotiations and concessions. Australians believe, for instance, that their beef trade with Japan has suffered as a result of bilateral U.S.-Japan negotiations.

The effect of trade liberalization on Australian farmers would depend on responses of producers and users in other countries. If subsidized exports shrank and importers' demand expanded, substantial benefits could accrue to many Australian farmers. Producers of grains, dairy products, ruminant meats, and sugar might profit most. If world prices rose, Australian consumers could pay more for meat, grain products, and other foodstuffs.

About half ($500 million annually) of the assistance to Australian farmers comes through higher prices paid by consumers. Domestic prices for dairy products, cotton, rice, sugar, and wheat have been above export values. This form of assistance has grown as world prices have fallen. Farmers receive

over $100 million annually in tax concessions and about $40 million in fertilizer subsidies. Significant assistance is provided for natural disaster relief as needed. Government research programs, inspection and marketing services, and tariffs also provide significant support to producers. The Rural Adjustment Scheme, costing about $25 million annually, provides loans to assist farmers in making enterprises more viable or efficient or to assist in their leaving the industry.

Domestic prices for food and feed wheat have exceeded export prices in recent years, providing assistance of about $7 a ton to producers during the study period. Under current arrangements, domestic prices are tied more closely to export returns, and the value of the transfers should decrease. It is possible that the world market price effects of multilateral trade liberalization could raise Australian wheat prices.

Domestic sugar prices are set according to a formula based on the Consumer Price Index and export prices. With the depressed world sugar prices of recent years, Australian consumers have subsidized producers. If trade liberalization increased world market prices, Australian producers would benefit.

The principal forms of assistance to meat producers are inspection services, research and extension services, fertilizer subsidies, and natural disaster relief. Under trade liberalization, producers of pork and poultry meat would face greater competition, but producers of beef and sheep meat could benefit greatly from improved access to foreign markets.

Dairy consumers substantially subsidized producers in recent years. Levies on domestic sales of butter, milk powders, casein, and cheeses were used to offset losses incurred on export sales. As production expanded and export markets shrank, the subsidy element of the domestic price-equalization program grew. New dairy marketing arrangements implemented in July 1986 are significantly altering the levy system. The goals are to reduce incentives to produce milk and to provide some protection to producers. If the world dairy market were liberalized, Australian producers could benefit from greater access to foreign markets, and consumers could benefit from reduced market controls and larger supplies of imported dairy products.

New Zealand

New Zealand is an important exporter of livestock products and specialty produce. Agricultural products account for two-thirds of total merchandise exports. Foreign markets buy about 90 percent of the wool produced, about three-quarters of its kiwifruit and sheep meat, and two-thirds of the beef produced. Three-quarters of the dairy product output and half of apples produced are exported.

New Zealand is radically restructuring its agricultural policies as a cornerstone of its program of economic reform. Subsidies and trade barriers are being phased out, other government involvement in the economy is being reduced, and user fees are being imposed on government services.

Before the Labor party assumed power in July 1984, New Zealand agriculture was heavily regulated and received considerable direct subsidies. These subsidies were justified as compensation for the high costs imposed on agriculture by

protecting the manufacturing industries. Statutory marketing authorities regulated sales of major agricultural products, and the government supported prices of meat, wool, and milk. Programs that had been instituted in the late seventies to encourage the expansion of agriculture became extremely expensive when world markets for dairy products and meat shrank in the eighties.

Significant agricultural assistance continued into 1985 and 1986 as programs were adjusted in accordance with the new policies. Specifically, farm improvement loans were forgiven, and the New Zealand Dairy Board's loan held by the Reserve Bank of New Zealand was written off. The New Zealand Meat Board's debt to the Reserve Bank was written off in March 1987. The level of assistance to agriculture will now be greatly reduced.

New Zealand, having acted unilaterally to liberalize trade, is working to maximize agricultural trade liberalization in the MTN. New Zealand places emphasis on market access, striving for the gradual elimination of quantitative import restrictions, tariffs, variable levies, and import licenses. One of its priorities is to have domestic policies that affect imports and exports addressed by GATT. New Zealand would benefit greatly from improved access for its meat and dairy products in the North American and West European markets.

The significant New Zealand agricultural policies likely to be addressed in the GATT negotiations are health and sanitary import restrictions and marketing boards. The Meat Board's role in foreign trade is declining, but the Dairy Board is a growing conglomerate.

New Zealand agriculture could gain substantially from global trade liberalization. New Zealand consumers would pay more for food if world prices rose, but they would benefit from the country's improved foreign exchange position.

The Less-Developed Countries

In the current MTN round, several factors enhance the ability of LDC's to affect the outcome on agricultural topics. Several LDC's are now major competitors with industrialized countries in the export of beef, cotton, rice, soybeans, and wheat. The emphasis on agriculture in this round of talks, compared with previous rounds, also invites greater participation by LDC's whose exports are often dominated by agricultural products. The greater potential for growth in both production and consumption by LDC's compared with industrialized countries recommends their inclusion in forming new trade agreements. Private consumption grew at an average annual rate of 5.1 percent in low-income countries during 1973-84, compared with 4.5 percent for middle-income countries and 2.6 percent for industrialized market countries. Gross domestic product in low-income countries rose 5.3 percent during 1973-84, compared with 4.4 percent for middle-income countries and 2.4 percent for industrialized market countries (14).

The LDC's bring several interests shared with the industrialized countries to the negotiations. Recent empirical studies have brought out the correlation between income growth and import demand, suggesting that trade relations that promote development in LDC's can add significantly to world demand at a time when industrialized countries face the major agricultural problem of surplus productive capacity (11). Lee and Shane found export earnings to be even more

important than income growth in accounting for agricultural imports by LDC's (10). Thus, a more open agricultural trade environment could mutually benefit developed and less-developed countries.

The current round of negotiations is further distinguished by the high level of debt held by LDC's. Debt in low-income LDC's rose from $14 billion in 1970 to $72 billion in 1984, representing 17 percent of GNP in 1970 and 24 percent of GNP in 1984. Other LDC's together held debt worth 35 percent of GNP in 1984 (14). With international credit markets relatively tight now, borrowers and lenders agree that the current balance of payments in LDC's constrains the availability of capital worldwide and threatens the viability of today's institutions. Thus, industrialized countries have even more incentive to improve the trade balance of LDC's.

In spite of these common interests, distinctions between LDC's and the industrialized countries remain important to the GATT negotiations. Since its inception, for example, the GATT has extended "special and differential" treatment to LDC's. For example, balance-of-payments considerations and "infant-industry" protection arguments can be used to justify the quantitative restrictions imposed by LDC's. In the same way, LDC's are not subject to the general prohibition on export subsidies for processed products that applies to developed countries. (As noted earlier, the rules governing export subsidies on primary products are less strict for both developed and less-developed countries). Further, important waivers to the GATT's most-favored-nation rules benefit LDC's. The United States and several other industrialized countries offer preferential tariff rates to qualifying LDC's through their generalized system of preferences (GSP) programs. However, there is growing political pressure to remove, or graduate, LDC's from the list of countries included in the U.S. GSP program. Issues related to the status of LDC's in the GATT will be considered in the new MTN.

Despite more lenient GATT rules for LDC's, past tariff-cutting rounds have not greatly helped LDC efforts to diversify exports and expand export earnings and employment through developing their manufacturing bases. Barriers to trade in industrialized countries continue to offer considerably more protection to value-added products than to primary products. Japan, for example, places no duty on hardwood logs although it has a 10-percent tariff on hardwood lumber and a 17.5-percent tariff on plywood (2). Many LDC's remain overly dependent on a few primary product exports, leaving them especially vulnerable to variable world prices.

LDC's were generally unenthusiastic about starting a new MTN round. Prior to the agreement reached in Uruguay, there was a major source of contention between the United States and a group of LDC's led by Brazil and India over whether or not to include services in the talks. The United States is interested in gaining greater access to these countries' service markets, while the LDC's are interested in protecting their growing but fledgling service sectors. A compromise was reached whereby services would be included in the new round but on a parallel track (6).

In past MTN talks, discussions on agricultural topics relating to LDC's have focused on market access for products typically exported by LDC's, such as sugar and tropical products, and on forming commodity agreements that would help stabilize LDC earnings from these products. At the start of the new round, a number of LDC's (particularly Argentina and Brazil) joined with

several developed-country agricultural exporters, including Canada, Australia, and New Zealand, to voice strong support for liberalizing agricultural trade. They believed that U.S. and EC governmental assistance to agriculture and high import barriers throughout the world have adversely affected their ability to compete in world markets. Studies indicate that LDC's that exported agricultural commodities would have earned much more in foreign exchange had agricultural protectionism been lower in recent periods. For example, Zietz and Valdez found that foreign exchange earnings would have been 500 percent higher in 1979-81 if world beef trade had been liberalized and that most of this increase would have gone to the Latin American countries. Trade liberalization in sugar would also have significantly increased the export earnings of LDC's in Latin America and Asia (15).

As net food importers, LDC's could be adversely affected by agricultural trade liberalization, at least in the short run. If freer trade led to higher world grain prices, then the higher food import costs would offset the benefits associated with higher prices for exported commodities. Nonetheless, higher world prices for agricultural products should help promote growth in the agricultural sectors of food-importing LDC's (2).

How much LDC's will be affected by trade negotiations also depends on the extent to which the LDC's will be expected to comply with new GATT agreements. The current MTN could ultimately lead to adjustments in the agricultural and trade policies of less-developed, as well as industrialized, countries. Many LDC's rely on parastatal marketing boards, quantitative restrictions, and import licensing schemes to control trade and domestic prices of agricultural products. The use of these kinds of policies by LDC's could be limited by agreements formed during this MTN round, reducing the autonomy that these countries have in agricultural decisionmaking. Many LDC's are being encouraged by other international institutions, such as the World Bank and the International Monetary Fund, to reduce the disincentive to agricultural production and export that follows from the use of export taxes and distorting exchange rate policies. Internal and external policy adjustments could strengthen the agricultural economies of LDC's.

MEASUREMENTS OF GOVERNMENT INTERVENTION IN AGRICULTURE

Government intervention in agriculture has received increased public attention in both domestic and international forums. Budget outlays for farm programs are often cited as an indicator of the level and extent of government support. These outlays represent direct transfers from the taxpayer to the agricultural sector. Increasing farm program budgets in many countries reveal the recent growth of government intervention.

Budget outlays are, however, less than satisfactory measures of the total support provided by government policy. Some policy instruments, such as tariffs, import quotas, and variable levies, permit producers to receive prices higher than prevailing world market prices. Consumers bear the cost of these policies because they must then pay prices that exceed world market prices. Yet this "tax" on consumers (along with the support received by producers) does not appear in the government budget. Government budget outlays also do not reveal help to producers in the form of other types of government intervention, such as concessional credit offered at below-market rates of interest.

This study estimates the effects of government policies on agricultural producers and consumers, using measures known as the producer subsidy equivalent (PSE) and the consumer subsidy equivalent (CSE). These measures include policies that result in budget outlays, such as deficiency payments and input subsidies, and policies that do not, such as tariffs, import quotas and permits, and variable levies.

Definition of Producer and Consumer Subsidy Equivalents

Josling developed the PSE/CSE approach to examine the support implied by government intervention in agriculture (3, 4). Josling's method was expanded in a recent (currently unpublished) study of agricultural policies undertaken by the Agricultural Secretariat of the Organization for Economic Cooperation and Development (OECD). His approach rests on the proposition that many aspects of government policies can be reduced to: (1) the level of subsidy that would be necessary to compensate producers (in terms of income) for removing government support under current programs, and (2) the level of subsidy that would have to be paid to consumers to compensate them for removing agricultural programs. Taken together, these two measures indicate the net transfer from other sectors, through the government, into the agricultural sector (9).

In this study, we report a PSE as a ratio between the total value of policy transfers to producers and total producer agricultural income (cash receipts plus net direct payments). Similarly, a CSE is expressed as a ratio between total value of policy transfers to consumers and total consumer expenditure for the agricultural commodity. PSE's can be positive or negative. This report refers to positive PSE's as producer assistance or support, and to negative PSE's as producer taxation. CSE's can also be positive or negative.

A PSE is typically the summation of the effects of many types of government policies. PSE components are derived in two ways: (1) by looking at budgetary effects of government policies and (2) by looking at the wedge that a policy instrument (or mix of instruments) drives between domestic and external prices. CSE's generally estimate the effects on consumers of policies that separate domestic and external prices. In several instances, CSE's also include policies assumed to have their direct impact on consumers rather than producers, such as expenditures on school lunch programs. Where policy instruments are functionally linked, such that they jointly affect producers (consumers), PSE's (CSE's) measure the net effect of the package of policies. They do this by using internal/external price differences rather than by attempting to isolate the effect of each policy instrument. For example, many governments intervene in the dairy sector through minimum price policies that are, in turn, supported by border measures such as tariffs or quotas.

PSE's and CSE's are based on prices, production, consumption, and trade under current policy conditions. When examined across countries or commodity markets, they show the relative importance of government policy in different countries and commodity markets in terms of its contribution to farmer revenues and consumer costs. When examined over time, they show changing government involvement in the agricultural sector. Changes in PSE's and CSE's can be due to country policy changes or to changes in world reference prices or exchange rates. These measures can be quite variable over time. PSE's and CSE's do not directly reveal the effects on production, consumption, trade, and prices of removing government intervention from agricultural markets.

Policies Included in the PSE/CSE Framework

This study focuses on support provided by six broad policy categories:

- o Market price support, involving border measures and price setting for the domestic market or for traded products.
- o Direct income support, involving direct payments to or from government agencies.
- o Programs affecting variable costs of production.
- o Programs affecting marketing costs.
- o Programs affecting long-term agricultural production.
- o Controlled exchange rates.

Table 1 includes examples of the policies included in each category. Typically, assistance due to market price support or exchange rate policies directly affects both producers and consumers and, therefore, enters both PSE and CSE calculations. Policies in other categories listed in table 1 are assumed to have their direct effect on producers and, therefore, enter only PSE calculations (3, 4).

Table 1--Examples of policies included in PSE estimates

Market price support:
o Domestic price supports linked with border measures (quotas, permits, tariffs, variable levies, and export restitutions)
o Tariffs and export taxes
o Two-price systems and home consumption schemes
o Price premiums (often used for fluid milk)
o Domestic price supports linked with production quotas
o CCC inventory and commodity loan activities
o Marketing board price stabilization policies
o State trading operations
Direct income support:
o Direct payments--deficiency, disaster, direct storage, headage and acreage diversion, PIK entitlements, stabilization payments, and other direct government payments
o Producer coresponsibility levies (negative support)
Programs affecting variable costs of production:
o Fertilizer subsidies
o Fuel tax exemptions
o Concessional domestic credit for production loans
o Irrigation subsidies
o Crop insurance
Programs affecting marketing of commodities:
o Transportation subsidies
o Marketing and promotion programs
o Inspection services
Programs affecting long-term agricultural production:
o Research and extension services
o Conservation and environmental programs
o Structural programs
Controlled exchange rates:
o Fixed rates
o Differential rates
o Crawling-peg rates

Policies Excluded from the PSE/CSE Estimates

The PSE and CSE measures incorporate most of the major government policies that directly affect agricultural production, consumption, and trade. The current set of estimates, however, excludes several important programs known to affect the agricultural sector. Policies not incorporated include:

- o EC national policies and other countries' state or provincial policies.
- o General economic tax policies which are differentiated by sector.
- o Food aid and export credit programs.
- o Voluntary export restraint agreements and phytosanitary regulations.6/
- o Social security benefits and programs for rural (not agricultural) development.

The PSE's do not measure forgone income due to policies that control supply, such as uncompensated acreage reduction programs in the United States and dairy production quotas in the EC and Canada. They also do not include the effects of government policies on intermediate product prices. For example, in the case of livestock, the PSE's do not include the effect (a tax) caused by policies that raise feed (grain and oilseed) prices. Higher feedgrain and oilseed prices are generally captured, however, in the CSE estimates for grains and oilseeds.

The CSE estimates in this study do not include U.S. food stamps or school lunch programs. These programs affect consumer expenditures on processed agricultural products. Data sets are not currently available to estimate the benefits of these programs in terms of raw agricultural products.

The Estimation Procedure for PSE's

Estimating a PSE for a specific commodity depends on the particular characteristics of the agricultural policy set in each country. However, policies that produce similar effects can be measured using the same conceptual approach and similar data sets under the PSE methodology. PSE's are usually measured at the farmgate. Using a standard method permits comparisons among countries and among commodities. However, trade effects may differ with the same PSE because of differing policy mixes or differing producer responses to policy changes.

There are two basic methods used to derive the numerator of the PSE: (1) government expenditure data or financial data are used to calculate the effects of some market price support programs and most other policies listed in table 1, and (2) the effects of other market price support programs are often measured by comparing the supported domestic market price with another unsupported domestic or external reference price.

In some cases, government budget data can be incorporated directly into the PSE estimate for a particular commodity. For example, U.S. deficiency payments and some Canadian stabilization payments are reported by commodity.

6/ In many cases, these policies are part of a package of border measures. In the case of domestic price supports linked with border measures that include voluntary export restraint agreements and phytosanitary regulations, the PSE measure can be interpreted as implicitly including the impacts of these policies.

In other cases, government budget data represent the aggregate amount given to a particular function, such as research or extension services. In these cases, the budget data are allocated across all commodities that receive support according to each commodity's share of agricultural output by value.

Financial data from government accounts are the source of data sets for most programs affecting variable costs of production (table 1). For example, support from concessional credit is calculated as the difference between the market rate of interest and the rate of interest charged by the government times the volume of loans issued. Support to inputs is allocated by commodity based on information in the government accounts or by a proportional scheme such as described above. Exchange distortions, due to exchange rate controls, are calculated by comparing consumer price indices in the country imposing the exchange rate policy and the United States.

Procedures for calculating PSE components are standardized for most of the groups of policies listed in table 1. This is not, however, the case for market-support policies. The diversity of calculation procedures occurs here because of the variety of systems used to provide price support. Some typical procedures used to estimate the market price support component of the PSE are given below.

Products with import barriers generally fall into two categories:

- Products protected with import tariffs. For these cases, such as beef in the United States, a per-unit value of the tariff is applied to all domestic production of the product (fig. 1).

- Products protected with import quotas (which may or may not be combined with import tariffs), state trading systems, or variable levies that are, in turn, coupled with domestic price supports or production quotas (and, in the EC, export refunds). For these cases (which include dairy products and sugar in the United States; beef, rice, and wheat in Japan; most commodities in the EC; and all commodities in Mexico), a domestic supported price is compared with an external reference price. The difference is then applied to all domestic production. Figure 2 shows the effect of an import quota on the PSE.

The procedure for calculating market price support for products with domestic supports but no border measures is less easy to generalize. Some examples include:

- Marketing board price stabilization policies. Direct contributions to the stabilization funds by the government or indirect contributions through interest rate subsidies to the fund provide the market price support estimate. Support provided by New Zealand's dairy board, for example, is measured using this approach.

- Two-price systems (whereby the domestic price is set above or below the export price). The value of such programs is calculated by comparing the supported domestic price with the unsupported export price and applying the difference to the quantity of domestic consumption. The total value of this program is entered as a tax or support to producers (depending on the relationship of domestic and export prices). The home consumption pricing scheme for wheat in Australia is an example of such a two-price system.

- o Fluid milk premiums. In this case, the difference between the fluid milk price and the manufacturing milk price, weighted in some cases, is applied to the quantity of milk used in the fluid market. Fluid milk premiums are calculated for the United States and Canada.

- o Grain and soybean price supports in the United States. The market price support consists of the interest subsidy implicit in CCC and farmer-owned reserve commodity loans and an estimate of the cost to the CCC of inventory and price-support activities. The cost to the CCC includes the interest paid for money borrowed to finance domestic price support operations plus the net cost of inventory operations (that is, purchases minus sales plus storage, handling, and processing costs). CCC financial data are used to derive these estimates.

The Estimation Procedure for CSE's

The CSE estimate is expressed at the wholesale level for grains and oilseeds, and at the retail level for meats, dairy products, and sugar.

The CSE measure is, in many cases, derived from the support per unit of production that is attributed to market price support in the PSE measure. For example, the per-unit level of market price support from the PSE measure can be converted to the appropriate level of the marketing chain and then multiplied by domestic consumption in order to obtain the value of market price support that enters the CSE calculation. The CSE is negative (representing a consumer tax) for products with import barriers, export subsidies, or high internal prices relative to world prices. Export taxes or export quotas imply positive CSE's (representing consumer subsidies). An overvalued currency results in an implicit subsidy to consumers of traded products, while an undervalued currency results in an implict tax to consumers of traded products. CSE's may be either positive or negative for products under a two-price system, depending on the relationship between the domestic and world prices. The market price support component of the CSE cannot be calculated in cases where the price support to producers does not result in a wedge between consumer and world prices. Such was the case for U.S. grain and oilseed price support programs during the period studied. Procedures for estimating the CSE's associated with import tariffs and import quotas are described in figures 1 and 2.

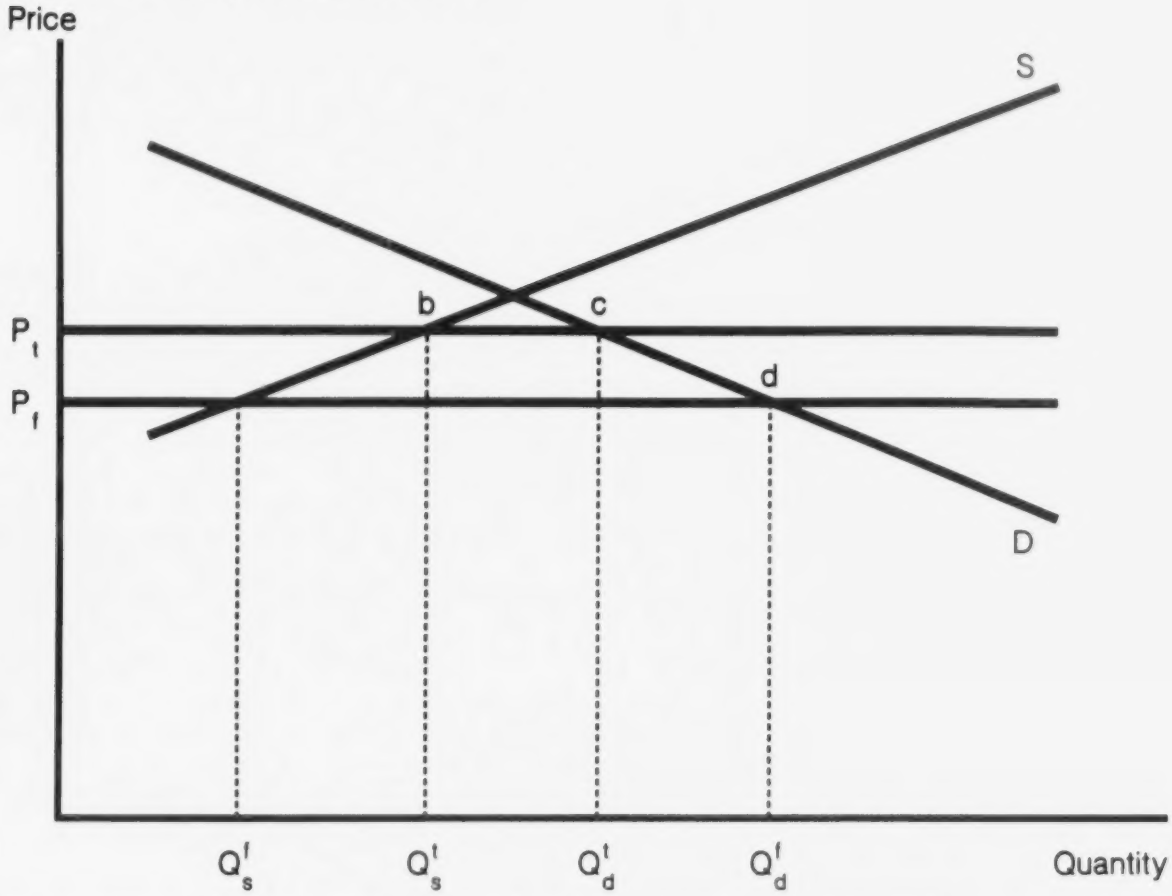
Measurement Issues

Comparing domestic to external reference prices is a major technique used in the PSE/CSE approach, as well as in other measures of protection. Use of this approach, however, raises a number of issues that should be considered in interpreting PSE and CSE estimates.

First, the external reference prices used in the calculations are derived from observed market prices, which, in turn, include effects of government policy actions in agricultural and financial markets. External reference prices vary as a result of exchange rate changes that may be entirely unrelated to behavior in agricultural markets. The PSE and CSE estimates presented in this report cover the 1982-84 crop years. Over this period, the value of the U.S. dollar appreciated considerably relative to other currencies. Almost all traded commodities are priced in U.S. dollars, no matter who the seller is. Thus, when the value of the dollar appreciates, external reference prices in

Figure 1

Effect of a tariff in estimating a subsidy equivalent

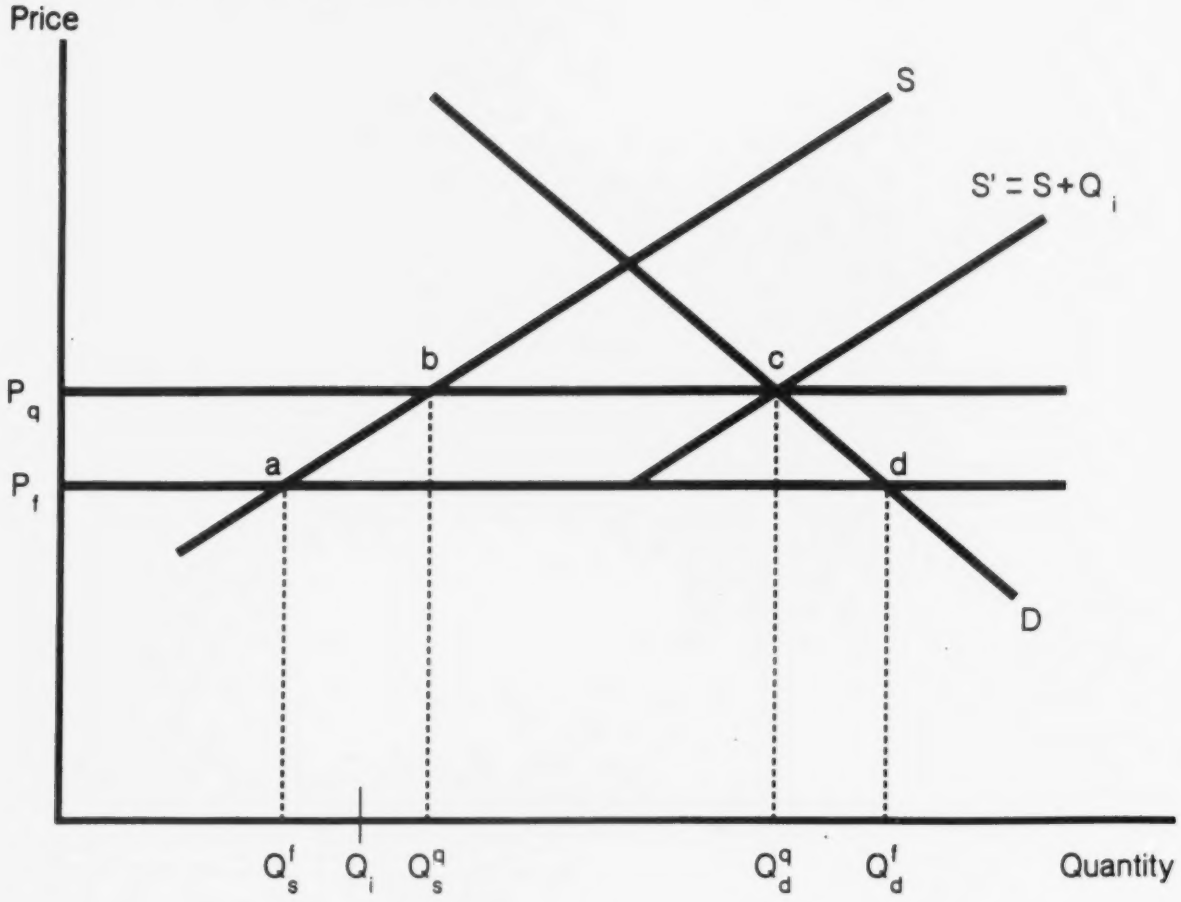


The world price (P_f) is below the intersection of domestic supply (S) and demand (D), so imports would amount to $Q^f_d - Q^f_s$ in a free market where the world price prevails. A tariff raises the price in domestic markets (P_t) and reduces imports to $Q^t_d - Q^t_s$.

The increase in welfare experienced by domestic producers as a result of the tariff is represented by the area $P_t\ P_f$ ab. PSE estimates, however, are based on levels of production and consumption observed in the presence of the tariff and are, therefore, not exact measures of producer welfare. The effect of a tariff on the PSE is estimated as the product of the tariff ($P_t - P_f$) and the quantity produced (Q^t_s). Similarly, the welfare cost of the tariff to consumers is represented by the area $P_t\ P_f$ cd. The CSE is estimated as the negative of the product of the tariff ($P_t - P_f$) and the quantity consumed in the presence of the tariff (Q^t_d). The PSE, expressed as a ratio to the value of production, is $(P_t - P_f)\ Q^t_s / P_t\ Q^t_s$, or $(P_t - P_f)/P_t$. Similarly, the CSE, expressed as a ratio to the value of consumption, is $(P_f - P_t)\ Q^t_d / P_t\ Q^t_d$, or $(P_f - P_t)/P_t$.

Figure 2

Effect of an import quota in estimating a subsidy equivalent



The world price (P_f) is below the intersection of domestic supply (S) and demand (D), so imports would amount to $Q_d^f - Q_s^f$ in the absence of import barriers. If an import quota (Q_i) is set at a smaller quantity than this, the market would draw additional quantities from domestic supply, along S'. The domestic price would rise to P_q, production would rise to Q_s^q, and consumption would decline to Q_d^q.

The increase in welfare experienced by domestic producers as a result of the import quota is represented by the area $P_q\ P_f$ ab. The effect of an import quota on the PSE is estimated as the difference in domestic price and world price ($P_q - P_f$) multiplied by the observed quantity of domestic production (Q_s^q). The welfare cost of a quota to consumers is represented by the area $P_q\ P_f$ dc and it is estimated as the negative of the difference in domestic price and world price ($P_q - P_f$) multiplied by the observed quantity of domestic consumption (Q_d^q).

countries other than the United States rise and the price differential between domestic and external reference prices is narrower than it would have been under a constant U.S. exchange rate.

Second, but related, the PSE and CSE measures do not capture the large-country effects on the world reference prices. The large-country issue is particularly relevant in interpreting the PSE estimates for grains. During 1982-84, the United States unilaterally reduced acreages and increased stocks of grains, thereby keeping world prices (that is, external reference prices) near the loan rate. The PSE estimates do not identify the benefit to grain producers in other countries caused by U.S. support of world market prices.

Empirical results of the PSE/CSE analysis follow. We will emphasize several important applications of these estimates. The applications are:

- o Comparisons of assistance levels to producers and consumers of a particular commodity among countries.
- o Comparisons of assistance levels to producers and consumers of distinct commodities in a single country or region.
- o Comparisons of pooled PSE's (that is, weighted averages of all individual commodity PSE's) among countries.
- o Comparisons of major sources of support to agriculture among countries.
- o Comparisons of how the cost of producer support is distributed between the consumer and the taxpayer among major countries.

EMPIRICAL RESULTS: COMPARISONS OF PSE's AND CSE's

We calculated PSE's and CSE's for grains, oilseeds, cotton, livestock, dairy products, and sugar in 17 countries. We ranked these PSE and CSE calculations by commodity and country in tables 2-5. These estimates are weighted averages for 1982-84 (except in several cases where data were unavailable). Each PSE represents the ratio between the value of policy transfers to producers of a particular commodity and the value of production (including any direct payments) of that commodity. Each CSE represents the ratio between the value of policy transfers to consumers of a commodity and the value of consumption of that commodity. Table 6 shows estimates of the pooled commodity PSE's (averages are weighted by each commodity's share in the total production value of the covered commodities) for each of the developed countries included in the study. The percentages of PSE's attributed to border measures are ranked for the developed countries in table 7. Table 8 shows how the cost of support to agricultural producers is distributed among food consumers and taxpayers.

In most cases, we present the PSE and CSE calculations in ranges to avoid an illusion of precision and to establish a rough basis for making cross-commodity and cross-country comparisons. For simplicity in presentation of results, we refer to assistance and taxation levels in the following arbitrarily assigned ranges: 0-24 percent as low, 25-49 percent as moderate, and 50 percent and greater as high. The categories apply to both PSE's and CSE's. Within categories, PSE's and CSE's are ranked alphabetically by country or commodity.

Table 2--Ranking of producer subsidy equivalent levels, countries by commodity, 1982-84 1/

Ratio 2/	Wheat	Rice	Corn	Sorghum and barley	Soybeans	Other oilseeds	Sugar	Cotton	Dairy products	Beef	Pork	Poultry meat
Producer tax: More tax than -.50							Nigeria					
-.25 to -.49	Argentina* India							India (LS)*				
-.10 to .-24		India Indonesia	Argentina*	Argentina (sorghum)*	Argentina*			India (MS)* Sudan (ELS)* (MS)*				
-.01 to -.09		Nigeria	Brazil		Brazil* India			Nigeria		Brazil*		
Producer subsidy: 0 to .09	Australia* New Zealand	Thailand*	Canada EC Nigeria	Australia (barley)* New Zealand (barley)*	Canada U.S.*			Australia*	Brazil	Australia* Canada U.S.	Australia* Canada* Taiwan* U.S.	Australia* Brazil* U.S.
.10 to .24	Canada* EC (Common)* S. Africa	Australia*		Canada (barley)* EC (barley)* U.S. (barley)*	Taiwan	Canada (flax)* (rape)* India (peanuts)* (rape)	Australia* Taiwan*	Mexico*	New Zealand*	New Zealand*	EC*	Canada S. Korea
.25 to .49	EC (Durum)* Mexico Nigeria U.S.*	Brazil EC Taiwan* U.S.*	S. Africa Taiwan U.S.*	Mexico (sorghum) U.S. (sorghum)*	EC Mexico	EC (rape)	Canada EC*	Brazil* U.S.*	Australia* EC* Taiwan U.S.*	Taiwan	S. Korea	EC* Japan Taiwan
.50 to .74	Brazil S. Korea Taiwan	S. Korea	Mexico S. Korea	Taiwan (sorghum) S. Korea (barley)	Japan S. Korea		Japan S. Africa* U.S.		Canada* S. Korea	EC* Japan S. Korea	Japan	
.75 to .99	Japan	Japan		Japan (barley)					Japan			

* = Net exporter during 1982-84.
1/ Some products lack data for some years.
2/ Ratio of policy transfers to gross domestic value of production including direct payments.

Table 3--Ranking of consumer subsidy equivalent levels of selected countries for commodity, 1982-84 1/

Ratio 2/	Wheat	Rice	Corn	Sorghum and barley	Soybeans and products	Other oilseeds	Sugar	Cotton	Dairy products	Beef	Pork	Poultry meat	Sheep meat
Consumer subsidy:													
.50 or more			Nigeria				Nigeria						
.25 to .49	Argentina		Argentina	Argentina (sorghum)	Argentina (bean)	India (rapeseed meal & peanut meal)		Nigeria India (MS)					
.10 to .24	India Nigeria S. Africa		S. Africa		India (meal)			India (LS)					
.01 to .09		India Indonesia Nigeria											
Consumer tax:													
0 to -.09	Canada New Zealand	Thailand	Canada EC Japan	Australia (barley) Canada (barley) New Zealand (barley)	Canada (bean) Japan (bean)	Canada (flaxseed & rape-seed)	Canada		New Zealand	Australia Canada New Zealand U.S.	Australia Canada EC Taiwan U.S.	Australia Canada Japan Taiwan U.S.	Australia
-.10 to -.24	Australia EC (Common & Durum) Japan S. Korea Taiwan	EC	Taiwan	EC (barley) Japan (barley) Taiwan (sorghum)	Taiwan (bean)		Australia		Australia (fluid milk) Canada (cheese & butter EC (fluid milk, NFDM, & cheese) U.S. (fluid milk & cheese)	EC		EC S. Korea	EC New Zealand
-.25 to -.49		Australia Taiwan			India (oil)	India (peanut oil)	EC S. Africa		Canada (fluid milk) EC (butter) Japan (fluid milk & products) U.S. (NFDM & butter)	Japan Taiwan	Japan S. Korea		
-.50 to -.74		Japan S. Korea		S. Korea (barley)	S. Korea (bean)	India (rapeseed oil)	Japan S. Korea Taiwan U.S.			S. Korea			
-.75 to -.99									S. Korea (fluid milk)				

1/ Some products lack data for some years.
2/ Ratio of policy transfers to total consumer cost.

Table 4--Ranking of producer subsidy equivalent levels, commodities by country, 1982-84 1/

Ratio 2/	United States	Australia	Canada	New Zealand	European Community	Japan	Taiwan 3/	South Korea 3/	India	Argentina	Nigeria	Mexico	Brazil
Producer tax: More tax than -.50											Cocoa* Sugar		
-.25 to -.49						Citrus			Cotton (LS)* Wheat	Wheat*			
-.10 to -.24									Cotton (MS)* Peanut meal Rice	Corn* Sorghum* Soybeans*			
-.01 to -.09									Rapeseed meal Soybeans Soymeal		Rice Cotton		Soybeans* Corn Beef*
Producer subsidy: 0 to .09	Beef Pork Poultry meat* Soybeans*	Barley* Beef* Cotton* Pork* Poultry meat* Sheep meat* Wheat* Wool*	Beef Corn Oats* Pork* Soybeans	Barley* Wheat	Corn		Pork*				Corn		Manu. milk Poultry meat*
.10 to .24	Barley*	Cane sugar* Manu. milk* Rice*	Barley* Flaxseed* Poultry meat Rapeseed* Rye* Wheat*	Beef* Fluid milk Manu. milk* Wool*	Barley* Common wheat* Pork*		Corn Soybeans Sugar*	Poultry meat	Peanuts* Rapeseed			Cotton*	
.25 to .49	Corn* Cotton* Dairy* Rice* Sorghum* Wheat*	Fluid milk	Sugar	Sheep meat*	Dairy* Durum wheat* Poultry meat* Rapeseed Rice Sheep meat Soybeans Sugar*	Poultry meat	Beef Dairy Poultry meat Rice* Tobacco	Pork	Peanut oil Rape oil Soy oil		Wheat	Sorghum Soybeans Wheat	Cotton* Rice
.50 to .74	Sugar		Dairy*		Beef*	Beef Pork Soybeans Sugar	Sorghum Wheat	Barley Beef Corn Fluid milk Rice Soybeans Wheat				Corn	Wheat
.75 to .99						Barley Fluid milk Manu. milk Rice Wheat							

* = Net exporter during 1982-84.
1/ Some products lack data for some years.
2/ Ratio of policy transfers to gross domestic value of production including direct payments.
3/ Impacts of input subsidies not included.

Table 5--Ranking of consumer subsidy equivalent levels, commodities by country, 1982-84 1/

Ratio 2/	United States	Australia	Canada	New Zealand	European Community	Japan	Taiwan	South Korea	India	Argentina	Nigeria
Consumer subsidy More than .50											Corn Sugar
.25 to .49									Peanut meal Rapeseed meal Cotton (MS)	Corn Sorghum Soybeans Wheat	Cotton
.10 to .24									Cotton (LS) Soybean meal Wheat		Wheat
.01 to .09									Rice		Rice
Consumer tax: 0 to -.09	Beef Pork Poultry meat	Barley Beef Pork Poultry meat Sheep meat	Barley Beef Corn Flaxseed Oats Pork Poultry meat Rapeseed Rye Soybeans Sugar Wheat	Barley Beef Milk Wheat Wool	Corn Pigmeat	Corn Poultry meat Soybeans	Pork Poultry meat				
-.10 to -.24	Cheese Fluid milk	Cane sugar Fluid milk Wheat	Butter Cheese	Sheep meat	Barley Beef & veal Cheese Common wheat Durum wheat Fluid milk NFDM Poultry meat Rice Sheep meat	Barley Wheat	Corn Sorghum Soybeans Wheat	Eggs Poultry meat Wheat			
-.25 to -.49	Butter NFDM	Rice	Fluid milk		Butter Sugar	Beef Dairy products Fluid milk Pork	Beef Rice	Pork	Peanut oil Soybean oil		
-.50 to -.74	Sugar					Rice Sugar	Sugar	Barley Beef Sugar Rice Soybeans	Rapeseed oil		
-.75 to -.99								Fluid milk			

1/ Some products lack data for some years.
2/ Ratio of policy transfers to total consumer cost.

Table 6--Weighted average PSE and major sources of assistance, 1982-84

Country and region	Weighted average PSE 1/	Major sources of assistance to producers			
		Grains and oilseeds	Dairy	Livestock	Sugar
	Percent				
Japan	2/ 72	Grains: State trading Oilseeds: Deficiency payments	Price support through government stockholding and border restriction. Also some deficiency payments	Beef: Quotas, tariff, and domestic price stabilization scheme Pork: Variable levy Poultry: Tariff	Tariffs, surcharges, and rebates
EC	33	Grains: Variable import levies and export subsidies Oilseeds: Deficiency payments	Variable import levies, export subsidies, and government purchases	Variable import levies and export subsidies	Variable import levies and export subsidies
Canada	22	Wheat and barley: Transport subsidies and income stabilization payments Corn: Tariff Oilseeds: Transport subsidies and income stabilization payments	Domestic price support (maintained with import quotas) and direct payments	Beef and pork: Tariffs, inspection services Poultry: Quota, price support, and tariff	Tariff, stabilization payments
New Zealand	23	Marketing board controlled trade and set prices	Interest rate concessions (farm improvement loans and loans to marketing board)	Direct income payment	Not applicable
United States	22	Grains: Deficiency payments, PIK entitlements, CCC inventory operations, and commodity loans Oilseeds: CCC inventory operations and commodity loans	Price supports maintained by tariffs, quotas, and government purchases	Beef: Tariff Other: General (R and D, inspection, etc.)	Price supports and quotas
Australia	9	Domestic consumption pricing	Domestic consumption pricing	Input subsidies and inspection services	Domestic consumption pricing

1/ Weighted average PSE includes commodities listed under country headings in table 4.
2/ Excludes citrus. When citrus is added, weighted PSE is 65 percent.

Table 7--Percentage of producer subsidy equivalent attributed to border measures or to policies linked with border measures, 1982-84 1/

Percent of PSE	United States	Australia	Canada	New Zealand	European Community	Japan
0-9	Barley Corn Cotton Pork Poultry meat Rice Sorghum Soybeans Wheat	Barley Beef Sheep meat	Barley Corn Pork Rapeseed Soybeans Wheat	Barley Beef Dairy Sheep meat Wool	Rapeseed Soybeans	Soybeans
10-24			Beef			
25-49	Beef	Dairy	Poultry meat Sugar	Wheat		
50-74		Cotton Wheat	Dairy		Durum wheat	Barley Manu. milk Poultry meat Wheat
75-100	Dairy Sugar	Rice Sugar			Barley Beef Common wheat Corn Milk Poultry meat Rice	Beef Fluid milk Pork Rice Sugar
100+					Sugar 2/	

1/ Some products lack data for some years.
2/ Total PSE is lower than part attributed to variable-levy system due to producer coresponsibility levies.

Table 8--Cost of producer support by contributor, 1982-84 1/

Country and region	Wheat	Beef	Milk
		Percent	
European Community:			
Consumers	69	94	75
Budget contribution	31	6	25
Canada:			
Consumers	.5	19	67
Budget contribution	99.5	81	33
Japan:			
Consumers	67	83	68
Budget contribution	33	17	32
United States:			
Consumers	0	41	96
Budget contribution	100	59	4
Australia:			
Consumers	59	0	85
Budget contribution	41	100	15
New Zealand:			
Consumers	49	8	8
Budget contribution	51	92	92

1/ Some products lack data for some years.

Table 2 ranks PSE levels by country and commodity. No clear pattern emerges from this table, although, typically, net exporting countries (indicated by *) provide less assistance to producers of a particular commodity than do net importing countries. Also, food grains, dairy products, and sugar are generally more heavily subsidized than pork and poultry. While producers of some commodities are taxed in LDC's, other commodity producers are subsidized.

Consumer tax (subsidy) equivalent levels (table 3) often mirror a country's producer subsidy (tax) equivalent levels (table 2). In other words, high producer subsidies often imply high consumer taxes in the form of high food prices. The major exception is wheat; in this case, the adverse effects on consumers resulting from producer price supports are frequently offset by government subsidies to consumers. Exporting countries sometimes assist producers by using discriminatory domestic pricing practices that raise consumer prices (Australian wheat and sugar, for example).

Wheat

The levels of assistance to wheat producers are presented in the first column of table 2. Levels of producer assistance varied widely among developed wheat-exporting countries. Canada provided a low level of assistance to producers, principally through rail transport subsidies. Australia's producer subsidies were also low, the major assistance measures being discriminatory domestic pricing, research, and input subsidies. During the study period, the United States provided a moderate assistance level, primarily through deficiency payments and PIK entitlements. Storage payments, inventory programs, and implicit interest rate subsidies on commodity loans were also important. EC assistance to producers of common and durum wheats was at low and moderate levels, respectively, through the use of variable levies, intervention buying, and export subsidies.

Major wheat importers, such as South Korea, Taiwan, and Japan, produced only small amounts of wheat but provided high levels of support to producers to divert resources from high-cost (surplus) rice production. High support prices were possible through state trading operations and strict border measures. These Asian countries, along with Brazil, provided the highest level of assistance to their producers. Brazil provided very high levels of assistance to its wheat producers through high price supports, credit subsidies, and government control of marketing and imports.

In other LDC's, such as Mexico and Nigeria, wheat producers were assisted at moderate levels. Assistance to wheat producers in these developing countries was granted as a means of achieving self-sufficiency and limiting expenditure of foreign exchange. Mexico's guaranteed prices for wheat were not particularly favorable to producers, but an undervalued currency and input subsidies provided substantial support. Nigeria used import restrictions and input subsidies to support its producers, resulting in a moderate net producer subsidy after accounting for the taxing effects of an overvalued currency.

Negative rates of assistance (taxation) were found in two LDC's, India and Argentina. Taxation of wheat producers stemmed from an interest in providing low and stable consumer prices in India, while Argentina was more concerned with generating government revenue. During the period studied, Indian wheat producers were taxed by government control of wheat trade and minimum support prices that were set below import parity prices. Producer taxes stemming from

border policies were only partially offset by relatively small input subsidies. In Argentina, a major wheat exporter, wheat producers were taxed explicitly with export taxes and implicitly through the government-controlled multiple exchange rate system.

The consumer subsidy (taxation) calculations tended to mirror the producer taxation (subsidy) levels. There were, however, exceptions. In Japan, Taiwan, South Korea, and Canada, for example, consumer tax levels were lower than producer subsidy levels (comparing tables 2 and 3). In Japan, Taiwan, and South Korea, consumer taxes were reduced by importing lower priced wheat. In Canada, producer input subsidies and direct income payments affected the value of PSE's but were not reflected in CSE's. Canada has a two-priced wheat policy but it had no measurable effect on producers or consumers during 1982-84. In Australia, consumer taxes on wheat were moderate because producers received some assistance through discriminatory domestic pricing. The effect of agricultural policies was to subsidize wheat consumers in Argentina, India, Nigeria, and South Africa.

Rice

Australia provided a low level of producer assistance with the use of home consumption pricing and input subsidies. The EC was a net rice importer and protected its producers at a moderate level through the variable-levy system. U.S. rice producers were moderately assisted through PIK entitlements and deficiency payments, Government inventory programs, and implicit interest subsidies on commodity loans.

Producers in South Korea and Japan were assisted at a high level. Taiwan's rice PSE falls in the moderate range. In these countries, where rice has been at the center of farm policy, high producer prices were guaranteed through the transactions of state trading agencies and the administration of strict border measures. Producers were also provided input subsidies. These policies have led to overcapacity problems and, consequently, to expensive land diversion and surplus disposal schemes in Japan and Taiwan.

Among the LDC's, India, Nigeria, and Indonesia lightly taxed their rice producers through state control of marketing and trade and, in the case of Nigeria, currency overvaluation. Thailand's producers received light assistance, with irrigation and fertilizer subsidies usually offsetting export taxes. In Brazil, rice producers received moderate assistance.

Rice consumers were subsidized at low levels in India, Nigeria, and Indonesia. Consumers in Japan and South Korea were heavily taxed through high domestic prices and tight import controls. Japanese consumer prices were above world prices but below producer prices, requiring large budgetary outlays in 1982-84. Taiwan's consumers were taxed at a moderate level. In Australia, consumer rice prices exceeded export prices, implying a moderate consumer tax level. EC and Thailand consumers were taxed at low levels.

Coarse Grains

Canada provided light assistance through inspection services, tariff protection (corn only), income stabilization payments to all its coarse grain producers, and transportation subsidies to its western coarse grain producers. Australia also provided light assistance to barley producers

through input and research subsidies. During the study period, New Zealand barley producers received light assistance from input and credit subsidies and tax concessions.

The CAP resulted in low levels of assistance to European coarse grains producers through the variable levies and intervention buying. Intervention buying and export subsidies have been provided for both corn and barley in recent years.

U.S. coarse grain producers were assisted at low to moderate levels during 1982-84 by deficiency, diversion, and storage payments, Government inventory programs, and below-market rates of interest on nonrecourse commodity loans. U.S. corn and sorghum producers also received PIK entitlements during 1983/84.

Argentina, a major coarse grain exporter, taxed its corn and sorghum producers through the exchange rate system and export taxes. Mexico, as part of a policy to increase its self-sufficiency in staple foodstuffs, subsidized its corn producers at high levels and its sorghum producers at moderate levels through its domestic price support program and input subsidies.

Japan, South Korea, and Taiwan imported large amounts of coarse grains in the study period. They protected their producers at high levels as part of their staple food policies. Coarse grains for feed were, however, imported relatively freely to support expansion in domestic livestock industries.

South Africa, usually a net exporter of corn, was a net importer during 1982-84 because of drought. Its producers were assisted at high levels by price supports and credit subsidies, which more than offset the taxing effects of an overvalued currency.

Consumption of coarse grains was taxed at relatively low levels, except in South Korea. CSE's for coarse grains were positive in Nigeria, South Africa, and Argentina.

Oilseeds

The United States provided little assistance to oilseeds producers. Soybean producers received no direct income support and relatively light assistance through CCC loan activities, credit subsidies, and crop insurance. In Canada, while eastern soybean producers received low levels of subsidies, including income stabilization payments, western rapeseed and flaxseed producers received more substantial support from transport subsidies.

Among the LDC's, India, Argentina, and Brazil taxed their soybean producers through export controls, export taxes, or overvalued currencies. India's controls on trade of oilseeds and oils, combined with chronically weak internal demand for meals, resulted in low taxation of soybean producers during the period studied. However, these same policies resulted in positive levels of assistance to producers of oilseeds with higher oil-to-meal ratios, such as rapeseed and peanuts. In Argentina and Brazil, soybean export taxes were used to generate government revenue and to encourage sales of the beans to the domestic crushing industry.

The importing countries of the EC encouraged increased production of soybean and rapeseed by paying deficiency payments, resulting in PSE's in the moderate

range. Japan and South Korea assisted soybean producers with deficiency payments or support prices, resulting in high PSE's. Much of their domestic production was for traditional food uses, while lower priced imports supported relatively dynamic pork and poultry sectors.

The CSE's indicate that Argentina subsidized the consumption of soybeans, through export taxes. India's policies subsidized consumers of oilseed meals. However, India's policies led to moderate to high taxes on the consumption of peanut and rapeseed oils. Japan's and Taiwan's policies resulted in low taxes on consumption of soybean products, while South Korea's policies resulted in high taxes.

Sugar

All the producing countries in the study for which sugar PSE's were calculated, except Nigeria, subsidized sugar production to some extent. Producers in the United States and Canada received higher levels of assistance than producers of most other commodities in those countries. PSE's were high in the United States, Japan, and South Africa, and moderate in the EC and Canada.

Australia, a large sugar exporter, provided a low level of assistance through a pricing scheme that has kept domestic prices above current world prices. Taiwan's producers also received low assistance through the setting of a higher price for sugar sold domestically than for exported sugar. European producers received support from a marketing quota system that designated amounts and prices for sugar sold domestically or exported. The export of surplus sugar was financed by government subsidies, which were offset by producer levies. South African producers received assistance mainly through import licensing.

Among the importers, Canada assisted producers with import tariffs and income stabilization payments. The United States, since May 1982, has relied primarily on import quotas. Nigeria provided tariff protection and input subsidies to its producers, but the effects of these policies were offset by the taxing effects of the overvalued currency.

Most of the world's sugar consumers were taxed through policies designed to assist producers. These tax levels were relatively low in Canada and Australia compared with those in the EC, the United States, East Asia, and South Africa.

Cotton

Developed exporting countries provided producer assistance from low levels in Australia to moderate levels in the United States. Deficiency payments, PIK entitlements, Government inventory programs, and below-market rates of interest on commodity loans assisted U.S. cotton producers.

India, Nigeria, and Sudan are three LDC's that taxed producers through either export controls or through the effects of an overvalued currency. These same policies subsidized consumers of raw cotton. India provided some input subsidy assistance to its producers, but this was more than offset by strict control of trade through such border measures as export quotas and duties. The taxing effect of Nigeria's overvalued currency overrode protection afforded through import tariffs and fertilizer subsidies.

Mexico and Brazil provided low and moderate levels of assistance, respectively, to their cotton producers. In both countries, cotton PSE's were lower than those for major import-competing crops such as wheat in Brazil and wheat, corn, and sorghum in Mexico.

Dairy Products

Subsidy equivalent levels were calculated for the dairy sectors in developed countries, Brazil, and the East Asian newly industrialized countries. For most net exporting countries, PSE estimates indicate that assistance levels to dairy producers were relatively high compared with those to other commodity sectors in those countries. Australian producers benefited from fluid milk premiums, and levies on dairy products sold domestically. The price of milk in the EC was supported by variable levies on dairy products and by intervention buying of butter and skim milk powder. Export subsidies were provided for dairy products in order to sell these products on world markets. Levies on Canadian producers were offset by direct Government payments, high prices maintained by strict border measures, and a Government procurement program. The New Zealand dairy sector benefited from a producer-funded stabilization account, bolstered by long-term, low-interest borrowings from the Government, input subsidies, and fluid milk premiums.

Importers typically provided even higher levels of assistance to their producers. The U.S. dairy producers were assisted at moderate levels with price supports, import restrictions, and Government purchases of surpluses. Japan and the East Asian newly-industrialized countries also administered restrictive border measures on dairy products to guarantee high internal prices. In contrast, Brazil's controlled producer prices for fluid milk (which have not kept up with inflation) provided very little assistance to domestic producers over the 3 years.

The consumer subsidy (tax) calculations reveal that dairy product consumers were taxed in all cases considered. In some countries, however, consumer taxes were less than producer subsidies because of offsetting programs. New Zealand provided fluid milk subsidies, while the EC provided a school milk subsidy and other subsidies in conjunction with welfare programs. In Japan, consumer prices for dairy products were lower than the equivalent producer price for manufactured grade milk through use of deficiency payments.

Beef

Among the developed-country exporters, Australia provided light producer assistance through export inspections and input subsidies. New Zealand also provided a low level of assistance through government inspection and grading, subsidized credit, and, in 1982/83, price supports. The EC provided high levels of government support through an intervention buying and variable levy system, and export subsidies for both beef and large amounts of veal.

Among the importers, the United States assisted beef producers at a low level with tariffs. The United States also bargained for voluntary export restraint agreements in 1983/84, but their effect is not included in the U.S. PSE estimates. Canada mainly used tariff protection to provide its producers with a low level of assistance. Japan used state-controlled pricing, import quotas, tariffs, and surcharges to support domestic prices well above import prices, resulting in a high PSE. Taiwan used tariffs to provide moderate

assistance and South Korea supported producers at a high level with strict border restrictions enforced by a state trading agency.

Beef consumers were taxed at high levels in South Korea, while Japanese and Taiwanese consumers were taxed at moderate levels. Consumers in the United States, Canada, New Zealand, and the EC were taxed at low levels.

Pork

Pork producers were lightly protected by exporting countries and the United States. Canada provided low assistance through an income stabilization program and tariff protection, although provincial stabilization programs (not explicitly accounted for in the calculations) contributed to the level of support. Taiwan used deficiency payments to provide low levels of assistance. The EC also provided low levels of assistance through variable levies and export subsidies, and, occasionally, intervention buying.

The United States provided only minimal support to pork producers through indirect measures, including research and inspection services. Japan protected its producers from imports with a variable levy resulting in a high PSE. South Korea banned pork imports, thereby providing producers a moderate degree of assistance.

Consumers of pork were taxed at a low level in the United States, Canada, the EC, and Taiwan. Japanese and South Korean consumers were more heavily taxed.

Poultry

Poultry producers were not provided high levels of assistance in any country studied. Among the exporters, the United States provided poultry producers with minimal assistance through research, advisory, and inspection services. Brazil provided low levels of assistance in the form of producer and exporter credits. EC producers received moderate support through variable levies, export subsidies, and occasional intervention buying.

Developed country importers like Canada protected their producers with tariffs and quotas to maintain prices above world levels. The Japanese provided tariff protection and contributed to a producer price stabilization fund. South Korea and Taiwan banned imports of chicken.

Consumer taxation levels for poultry products were low compared with taxation levels for some of the other products studied.

Country Assistance Profiles

Table 4 provides a cross-country comparison of the levels of government assistance to producers for a wide range of agricultural commodities. The table reveals a pattern that tends to confirm conventional notions about agricultural assistance levels during 1982-84.

The export-oriented countries of Canada, Australia, and New Zealand typically provided light to moderate assistance to their agricultural sectors. The PSE's for most of these countries' commodities fell into the low range. New Zealand's pastoral sectors, moderately assisted during 1982-84, are much less so today since the elimination of supplementary minimum prices for mutton,

lamb, beef, wool, and dairy products, and rapid phasing out of virtually all other forms of assistance. In Australia, dairy products were more protected than other commodities. Canadian sugar producers received somewhat more protection than most other producers, except for dairy producers who were heavily assisted.

The distribution of assistance in U.S. agriculture varied across commodities. Soybeans, pork, poultry meat, and beef were lightly assisted, while most grains and dairy products were assisted at moderate levels. The PIK program was a major source of assistance to grain producers during the period studied. Sugar producers were heavily assisted in the United States during 1982-84.

PSE's in the EC, with several exceptions, were in the moderate range. Beef production was heavily protected by the CAP, while coarse grains, common wheat, and pork were lightly assisted during 1982-84.

Many farm activities in Japan were heavily assisted (beef, soybeans, dairy, sugar, and grains), but some were not (citrus and poultry). Poultry meat production is a farm activity that was not constrained by limited land resources and that has shown rapid productivity growth through advances in management and technology.

Taiwan and South Korea reflected a pattern of assistance similar to Japan's. In both countries, assistance levels were moderate to heavy for most commodities with border measures, the most important form of assistance. However, the distribution of assistance included light assistance for pork, corn, soybean, and sugar producers in Taiwan and for poultry producers in South Korea. Unlike Korea and Japan, Taiwan was a significant exporter of farm commodities like pork and sugar.

In some LDC's, agricultural policies, including exchange rate policies, taxed producers. This situation is particularly true for exported commodities; for example, grains and soybeans in Argentina, soybeans and beef in Brazil, cocoa in Nigeria, and cotton in India. Domestic producers of some imported commodities were taxed in the interest of providing low-priced foods. Examples are wheat and rice in India, rice and sugar in Nigeria, and corn in Brazil. In these cases, assistance to producers through input subsidies was more than offset by the negative effects of state trading operations or foreign exchange policies.

While producers of many commodities in LDC's were taxed, some were assisted (grains and soybeans in Mexico; wheat, rice and cotton in Brazil; wheat in Nigeria; and edible oils in India), reflecting policies to increase self-sufficiency in staple foods and limit foreign exchange expenditures. Thus, although LDC's as a group tended to provide less support to agricultural producers than did developed countries, there was nonetheless a wide variation in assistance levels depending on the country and commodity considered.

Table 5 ranks the CSE estimates by country. CSE's tend to mirror PSE's. In other words, heavy subsidies to producers typically imply heavy taxes to consumers because policies that raise producer prices (such as tariffs, quotas, and domestic price support programs) also raise prices to consumers. However, because it is assumed that some policies included in PSE's (such as input subsidies and direct income payments to producers) are not reflected in

consumer costs, CSE's do not always mirror PSE's. Also, some CSE's measure food distribution and consumer pricing policies used to offset the tax to the consumer.

Consumer taxes were highest in Japan, South Korea, and Taiwan (table 5). CSE's for the EC were typically lower than for the East Asian countries but higher than those for Australia, New Zealand, Canada, and the United States. There was a wide range of CSE values for the United States: sugar consumers were heavily taxed, and dairy and meat consumers were lightly to moderately taxed. CSE's were not estimated for U.S. consumers of grains and oilseeds since U.S. consumers of these products pay world market prices. U.S. grain and oilseed consumers are affected by the U.S. price and income support system to the extent that these policies influence world price levels. However, these effects are not included in CSE's.

Consumer subsidy equivalents were often positive in LDC's. Argentine consumers were subsidized through export taxes, which depress domestic prices relative to export prices. Indian consumers received price subsidies through the activities of state trading or distribution enterprises. Nigerian and South African consumers received implicit food price subsidies through the maintenance of overvalued currencies.

Comparisons of Weighted Average PSE's

Tables 2 and 4 rank PSE's for a wide range of individual commodities. Table 6 shows the results for developed countries of weighting these individual commodity estimates by each commodity's contribution to the total production value of the commodities analyzed. The table also shows the major sources of producer support; that is, the most important policy instruments in the PSE calculations for four commodity groups: grains and oilseeds, dairy products, livestock products, and sugar.

Weighting the PSE's to find an average level of support for the sector provides a similar profile of cross-country comparisons to that found in table 4. Japan clearly had the highest average support level (72 percent). Although some Japanese commodities were assisted much more lightly, the average PSE was weighted very heavily by rice, for which producer support was very high. The EC had the second highest average PSE (33 percent) in the 1982-84 period. Most EC commodities were supported at levels close to the EC average.

Although certain U.S. commodities were supported at higher levels than in Canada or New Zealand, all three countries' average PSE's for the study period are very close. The U.S. average PSE was heavily weighted by relatively low PSE's associated with high-value commodities like soybeans, pork, poultry, and beef. New Zealand's average was heavily weighted by the relatively high PSE's for the pastoral sector, including sheep meat and wool, which were aided by large direct payments during 1982-84. Canada's average PSE reflected the importance of its export-competitive grain and oilseed sectors.

Australia's average PSE for 1982-84 was clearly the lowest among the developed countries included in this report, reflecting the fact that only Australia's dairy producers received significant levels of price and income support.

Table 6 underscores the diversity among countries of policy instruments used to provide assistance to agricultural producers. Within some countries, there is considerable diversity among policy instruments used to support producers of different commodities.

Much Japanese assistance was provided with border restrictions. Food grain producers were protected through the operations of the state trading agencies. Soybean producers were assisted by deficiency payments that allowed the domestic livestock industry to benefit from low-priced soybean and soymeal imports. Imports of dairy products and beef were also controlled by a state trading agency that administered quotas and imposed tariffs and surcharges. Pork and poultry producers were assisted by a variable levy and tariff, respectively. Sugar producers were protected with import tariffs and surcharges.

Excluding oilseeds, EC producers were assisted by border measures (variable levies) or policies linked to border measures (intervention purchases). These measures led to high internal prices and surplus production for many commodities. The EC was competitive on world markets in many of these commodities through the use of export subsidies. The EC provided deficiency payments to encourage oilseed production.

In the study period, the United States typically provided producer assistance by means not directly related to border measures; that is, by direct cash (deficiency) or in-kind payments. The exceptions are beef, dairy products, and sugar for which border measures were used. Beef producers received minimal assistance through tariffs and voluntary restraint agreements, whereas dairy producers and, even more so, sugar producers received substantial assistance through import quotas.

Canada's system resembled that of the United States in that border measures were important in providing support to the dairy, livestock, and sugar sectors but not to the grain and oilseed sector. Grain and oilseed producers benefited most from transportation subsidies and income stabilization payments.

Most assistance to New Zealand and Australian producers has come through some form of input subsidy, particularly interest rate concessions on farm improvement loans, tax concessions, fertilizer subsidies, and loans to farmer marketing boards. Australia maintained prices for wheat, sugar, and dairy products sold in the domestic market higher than prices received for exports.

Importance of Border Measures in the Total Level of Producer Assistance

PSE's are calculated by adding the assistance provided through many different types of policy instruments and farm programs. Therefore, the PSE framework can also be used to indicate the importance of different types of policies in contributing to the total level of support. Table 7 shows the percentage of each PSE that was attributed to border measures (tariff or nontariff barriers or government control of trade) or to domestic price support programs that were maintained with the use of border measures. For example, it indicates that, in the United States, 25-49 percent of the total assistance provided to beef producers was due to import restrictions even though the total level of assistance was low. This table again highlights how different these countries' agricultural policy regimes are.

The United States did not rely on border measures as a major source of assistance to grain, oilseed, and livestock product producers. Border measures were, however, an important component of the PSE's for dairy products and sugar.

Both the EC and Japan relied heavily on border measures for support to producers of most agricultural commodities. On the other hand, oilseed producers in both regions received deficiency payments as the major source of government support.

The profiles of Australia, Canada, and New Zealand appear similar to that of the United States, in which border measures are a relatively unimportant source of agricultural assistance. In Canada, as in the United States, beef, dairy, and sugar producers benefited from protection through border measures. Poultry meat producers also received support through border measures in Canada.

Distribution of the Cost of Support to Agricultural Producers

Many forms of government support to producers also affect prices received by consumers. In other words, consumers bear the cost (or, sometimes, receive the benefits) of the programs. Policies included in this category are those that drive a wedge between domestic and world prices, such as border measures. When these policies act to provide positive price support to producers they are often referred to as "no-cost" producer subsidies because they typically have little effect on the government budget. Other policies do not have direct effects on consumers but do incur budget outlays, the cost of which must eventually be borne by the taxpayers. It is often possible to divide PSE's into two types of support: that provided by the consumer through higher-than-world agricultural commodity prices and that provided by the taxpayer through budgetary outlays.

The distribution of the cost of government support to producers between food consumers (no-cost subsidies) and taxpayers differs markedly among countries and, within a country, among commodities (table 8). In the OECD countries, border measures raise prices to consumers as well as producers. Consequently, border measures are viewed as hidden subsidies to producers, the cost of which must be borne by consumers.

In the EC and Japan, most of the cost of public assistance to agricultural producers is borne by consumers through higher food prices. About half of the budget contribution in the EC represents export subsidies necessary to move high-priced EC commodities onto the world markets. Large Japanese budget outlays are used to reduce consumer rice costs. Deficiency payments are also paid to Japanese dairy and oilseed producers.

Canada and the United States have similar profiles in the distribution of the cost of assisting producers. In both countries, grain consumers bear virtually none of the cost of farm-income support or stabilization policies, and most of the support to beef producers also comes from taxpayer contributions. U.S. and Canadian dairy consumers, however, bear most of the support to producers. Australian consumers bear the high cost of dairy pricing policies but none of the cost of supporting beef producers. Support to the New Zealand farmers was largely through government budget contributions. Consumers paid nearly half the cost to support wheat producers, little to support beef producers, and nothing for assistance to milk producers.

POSTSCRIPT

ERS analysis of government intervention in agriculture and agricultural trade liberalization is ongoing. The results presented here, the measures of producer and consumer subsidy equivalents for 1982-84, represent the first phase of the trade liberalization project. These results are important because they condense the array of government policies affecting agriculture into summary measures that can be compared across countries and commodities. PSE's and CSE's provide a way for countries to monitor and measure each others' policy changes. They also offer a possible framework for multilateral exchange of concessions on agricultural policies.

Despite their potential usefulness, PSE's and CSE's alone do not fully reveal the effects of government involvement in agricultural production, consumption, trade flows, or prices. Because PSE's in most major trading countries are positive, while CSE's are negative, they do suggest that, in the absence of government intervention, world commodity prices would generally be higher. This hypothesis is supported by trade liberalization analysis at the World Bank (14). However, the actual effects of government policies on world and domestic markets cannot be known without an understanding of the response of producers and consumers to policy changes and without incorporating the effects of supply-reducing policies, such as U.S. acreage reduction programs, into the analysis.

A major component of the trade liberalization project remains to be completed: to estimate the effects of removing government intervention on world trade flows and prices, and on production and consumption at the national level. This second phase of the analysis will be carried out with the use of a world policy simulation model being developed in ERS (12). PSE's and CSE's will be the principal policy levers in this model. However, the framework allows consideration of changes in acreage reduction and supply management programs, as well as changes in levels of producer and consumer subsidy equivalents.

As the trade liberalization study continues, the international economy and policy environment continue to change. Some policy changes, such as those in the U.S. Food Security Act of 1985, represent reactions to continuing adverse world market conditions and attempts to counteract the adverse effects of other countries' policies. Changes in internal policies and changes in world market prices and exchange rates affect the cost of assistance to the agricultural sector. For this reason, ERS is preparing to update PSE's and CSE's in order to provide an accurate picture of government support in an evolving agricultural trade setting.

Since 1984, there have been a number of key policy changes in the countries covered by this analysis that could affect the value of PSE's and CSE's, and the effects of countries' policies on markets. In the United States, the Food Security Act of 1985 gave rise to several policy changes that will affect the level of assistance to producers in 1986 and beyond. Of particular importance are the lower loan rates for wheat, rice, feedgrains and cotton, a dairy herd termination program, and enhanced export assistance. Target prices for the grains were frozen with reductions scheduled after 1987. While data for some components of the PSE's are incomplete, it is clear that direct payments to U.S. farmers (cash and in-kind) were markedly higher in 1986 than during 1982-84. With lowered loan rates and frozen target prices, the deficiency payments made to farmers rose significantly in 1986. The 1985 Act also

authorizes direct payments through other programs, including paid land diversion, farmer-owned reserve storage, and the conservation reserve.

U.S. policy continues to emphasize acreage reduction as a means of offsetting the supply stimulus inherent in price and income support programs. The 1985 Act continued acreage reduction programs with participation required to receive program benefits. A conservation reserve for land was also put into place. Finally, changes were made to break the link between deficiency payments and production.

Since 1984, the EC has attempted policy changes in the dairy and cereals sectors to reduce production and limit budget costs. Dairy policy reforms begun in 1984 were designed to reduce milk deliveries by lowering marketing quotas and instituting a substantial producer levy on deliveries in excess of the quota. In the cereal sector, the 1986 reform reduced feedgrain support prices (except for corn) by 5 percent and introduced a 3-percent producer coresponsibility levy. Some implementation problems have limited the effectiveness of these reforms. In addition, the sharp depreciation of the dollar and the decline in dollar-denominated world cereal prices dramatically increased the cost of the CAP during 1986. Those increased costs would be reflected in considerably higher PSE's.

Japan's agricultural policy goals have remained essentially unchanged since 1984, although there is increasing pressure from urban consumers, business interests, and Japan's trading partners to reduce protection to agricultural producers. Abundant rice harvests in 1985 and 1986 required large government outlays to rice producers, despite the fact that rice prices were frozen at 1984 levels. Lower world prices plus the rapid appreciation of the yen against the dollar since September 1985 imply larger producer subsidy equivalents for rice and other commodities since 1984. Growing rice stocks have led the Japanese Government to increase the riceland diversion targets quite significantly.

Levels of support to Canadian producers have increased or stayed the same since 1984. Increases are due to both increases in government expenditures and declines in producer values due to falling prices. Early in 1986, the Federal Government announced several initiatives to help grain and oilseed producers. These include a cap on rail freight rates, higher domestic wheat prices to help offset lower export prices, and increased fuel tax rebates. In addition, the Federal Government will pay CAN$1 billion in deficiency payments to grain and oilseed producers for the 1986/87 crop year. This payment, unprecedented in recent Canadian agricultural policy, will increase the level of support to grain and oilseed producers. The Canadian Government argues the payment is necessary to offset the price-depressing impacts of the EC CAP and the U.S. 1985 Food Security Act.

Canada's PSE's for dairy, poultry, beef, pork, and sugar are expected to have changed little since 1982-84, despite some policy revisions. A countervailing duty has been placed on beef imports from the EC, providing a small increase in support to beef producers. The Federal Government is attempting to formulate a new sugar policy that would eventually raise the support to sugar producers.

Although the Australian Government has maintained its policy of minimizing producer assistance that distorts market signals, depressed world crop prices

are resulting in larger subsidies to Australian producers. Assistance for structural adjustment and marketing has been increased. In response to severe financial distress in the sugar industry, state and commonwealth aid has been increased. For other crops, policies and programs existing in 1984 have resulted in higher producer subsidies as world prices have declined. Most significantly, the Government of Australia is likely to make substantial payments to fulfill its commitment to underwrite wheat prices for the 1986/87 and 1987/88 crops. Domestic pricing arrangements that subsidize rice and cotton producers and tax consumers are resulting in larger transfers from consumers to producers. The drop in world dairy product prices raised subsidies to producers in 1985 and 1986, but new marketing arrangements will reduce these subsidies from consumers.

New Zealand is the one developed country covered in this analysis that has unilaterally reduced government intervention in its agricultural sector since 1984. Subsidies and trade barriers are being phased out, other government involvement in the economy is being reduced, and user fees are being imposed on government services. Significant assistance to agriculture continued through 1985-86; in 1987 and beyond, the level of assistance to agriculture will be greatly reduced.

LDC's face considerable pressure from international lending institutions, including the World Bank and the International Monetary Fund, to unilaterally liberalize agricultural trade and reduce government involvement in agriculture. In some cases this has meant reducing disincentives to agricultural producers by lowering export taxes and devaluing exchange rates. For example, since 1984, Argentina has reduced export taxes (and is considering a land tax) and Nigeria has sharply devalued its currency. Other countries, such as Mexico, are being asked to reduce government transfers to parastatal marketing boards, to reduce subsidies for credit and other inputs, and to eliminate consumer subsidies. The ability of LDC's to buffer their agricultural producers or consumers from worsening world market conditions has been sharply curtailed by these countries' financial constraints.

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GLOSSARY

Common Agricultural Policy (CAP). A complex system of support for EC agriculture designed to develop a common market with free internal trade and common financing. Relatively stable prices are maintained within the EC with guaranteed producer prices and a system of variable levies. Export subsidies are used to place commodity surpluses on world markets.

Consumer Subsidy Equivalents (CSE's). The level of subsidy that would be necessary to compensate consumers for the removal of government programs. The CSE for a particular commodity is negative when the net effect of all programs affecting that commodity in a country is to increase the price consumers pay for food and positive when consumers pay less for food than they would in the absence of the programs. These are expressed in the study as percentages of consumer expenditures on selected commodities in order to measure and compare the rate of subsidy received by consumers in various countries.

Controlled exchange rates. Relative values of currencies established and maintained by Government intervention.

Export subsidy. Government payment to encourage exports from a country, used most commonly when internal prices exceed export prices. The subsidy may be either fixed or variable and either partially, fully, or more than cover the difference between domestic and world prices.

Export tax. Fee paid on exports to the government of the originating country. An export tax may be a constant value per unit or it may be assessed as a percentage of the commodity price.

General Agreement on Tariffs and Trade (GATT). Multilateral agreement now signed by 92 countries which establishes rules and guidelines for regulating world trade among members, and a forum for countries to discuss and resolve trade disputes. An underlying principle of the GATT is that trade should be restricted only through the use of uniformly applied tariffs.

Marketing boards. Quasi-governmental buying or selling agents.

Multilateral Trade Negotiations--the Uruguay round. Negotiations begun in September 1986 at the initiation of GATT member countries. The objectives of this MTN round relating to agriculture are to improve market access, deal with various issues related to export subsidies, and reduce unnecessary health and sanitary regulations.

Nonrecourse loan and deficiency payment program of the United States. A program that entitles producers who participate in acreage reduction programs to receive deficiency payments and to place commodities under nonrecourse commodity loans. The deficiency payment rate per bushel is the difference between a target price and either the market price or loan rate (whichever is higher). Producers who pledge their crop as security receive nonrecourse loans at established loan rates. If market price is above the loan rate, producers may repay their loan with interest and sell their crop. Otherwise, they may forfeit their crop as settlement for the loan.

Nontariff trade barrier. Any type of restraint on imports or exports other than a tariff.

Payment in kind (PIK). A program used in the United States in 1983 and 1984 whereby qualifying producers received commodities in exchange for reducing acreage of certain commodities.

Policies affecting trade. Government policies that affect imports or exports of a country either directly, by regulating trade or imposing fees on trade, or indirectly through their affects on production or consumption decisions.

Producer Subsidy Equivalents (PSE's). The level of subsidy that would be necessary in order to compensate producers (in terms of income) for the removal of government programs affecting a particular commodity. The PSE for a particular commodity is positive when the net effect of all programs affecting that commodity in a country is to increase the incomes of producers above what they would be in the absence of these programs, and negative when the net effect of all programs reduces incomes. PSE's are expressed in the study as a percentage of producer income in order to measure and compare the rates of protection received by producers in various countries.

State purchasing agents. A system which uses state authority to determine and regulate trade flows and values.

Tariff. Fee paid on imports to the government of the receiving country. A tariff may be a constant value per unit or it may be assessed as a percentage of the commodity value.

Variable levy. Fee paid on imports to the government of the receiving country levied for the purpose of raising the import price to the level of some desired internal producer price. The levy is variable because as the world price changes the amount of the levy must change in order to equalize the two prices.

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